

2002 LONG-TERM ECONOMIC AND LABOR FORCE FORECAST FOR WASHINGTON

APRIL 2002

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Executive Summary

THIS ANNUAL PUBLICATION contains long-term population, labor force, employment, and personal income projections for Washington State. The Office of Financial Management (OFM), Forecasting Division, and the Employment Security Department, Labor Market and Economic Analysis Branch jointly prepared the labor force and employment projections. The forecast horizon extends from 2001 to 2026. The medium-term forecast for the 2001-2003 period is consistent with the February 2002 Economic and Revenue Forecast Council official state economic forecast.

The 2001 recession is a shallow, production-side recession, led by the bursts of business capital investment and equity market bubbles; while consumer spending and housing market remain healthy. The coming recovery is expected to be a slow and weak one, because many factors that traditionally lead the recovery, such as housing, sales of consumer durable goods, and lower interest rates were not significantly affected by this recession and thus cannot provide much stimulus needed for a vigorous rebound of the economy. On the production side, the current low capacity utilization rates and a weak prospect for corporate profits suggest that business capital investment will grow at a very gradual pace.

Washington Population, Labor Force, Employment, and Income

	Population (1,000)	Labor Force (1,000)	Employment (1,000)	Per Capita Income (1996\$)
1970	3,413	1,417	1,080	14,999
1980	4,132	1,985	1,609	19,695
1990	4,867	2,537	2,142	23,270
2000	5,894	3,046	2,709	28,931
2010	6,648	3,458	3,086	34,517
2020	7,545	3,790	3,472	41,944
2026	8,059	3,981	3,674	46,361

Population

- **Washington's population will increase 28 percent by the year 2026.** In 2001, about 6.0 million people lived in the state. The state population is expected to increase 2.1 million over the next two decades, reaching 8.1 million by 2026.
- **Aging of the population will be the most important demographic phenomenon in the next few decades.** In 2001, 11.2 percent of the Washington population was age 65 and over. By 2026, this age group is projected to account for 18.5 percent of total state residents. Most of the increase in the elderly population will take place after 2010, when the Baby Boom generation starts entering this age group.

Labor Force

- **Washington's total labor force will increase 30 percent between 2001 and 2026.** This amounts to a gain of 924,000 workers, from 3.06 million in 2001 to 3.98 million by 2026.
- **The labor force participation rate will be lower in 2026 than it is today.** In 2001, the labor force participation rate in Washington was 67.5 percent; the rate is projected to decline to 64.0 percent by 2026. Most of the decline will occur during the 2010-26 period when a large portion of the Baby Boom population shifts into the retirement age.
- **Washington's labor force will become more diversified in terms of age, sex, racial, and ethnic compositions.** By 2026, 47 percent of the state labor force will be female; workers over age 55 will represent about 19 percent of all state workers, substantially higher than the 12 percent share in 2001. Share of non-white workers in the state labor force is expected to rise from 12.5 percent in 2001 to 15.4 percent in 2026.

Employment

- **Between 2001 and 2026, 972,000 non-farm jobs will be added to the Washington economy.** Employment in the state is expected to increase at an average annual rate of 1.2 percent over the next 25 years, from 2.70 million in 2001 to 3.67 million by 2026.
- **Most of the projected employment growth will be in retail and services industries.** From 2001 to 2026, trade and services are predicted to account for about two-thirds of total job increase in the state. Employment in the goods-producing sectors (i.e., manufacturing, mining, and construction) will increase moderately due mainly to the anticipated productivity growth; by 2026, these sectors will account for only 16.0 percent of total jobs in the state.
- **Washington's economy will become increasingly diversified.** For decades, state employment was highly concentrated in defense, aerospace, and timber industries. Booms and busts in these industries likely would induce the same conditions in the overall state economy. The growing importance of trade and services employment in the future will lead to more diversified and stable economic growth for the state.

Personal Income

- **Washington's total personal income will increase 125 percent between 2001 and 2026.** In 1996 dollars, total personal income in Washington amounted to \$173.1 billion in 2001, and is projected to reach \$375.0 billion by 2026.
- **Per capita income in Washington will remain above the national average.** In 2001, per capita income in the state was estimated at \$31,484, only slightly (i.e., 0.4 percent) above the national average. The projected state per capita income in 2026 will be inflation adjusted, 61 percent higher than the 2001 level, and 2.2 percent above the forecasted national average.
- **Growth in average earnings will slow down in the 2000-02 period.** In 1999, average earnings in the state rose to 6.5 percent above the national average. But the state's earning growth will be hit harder by the latest recession than the rest of the nation.



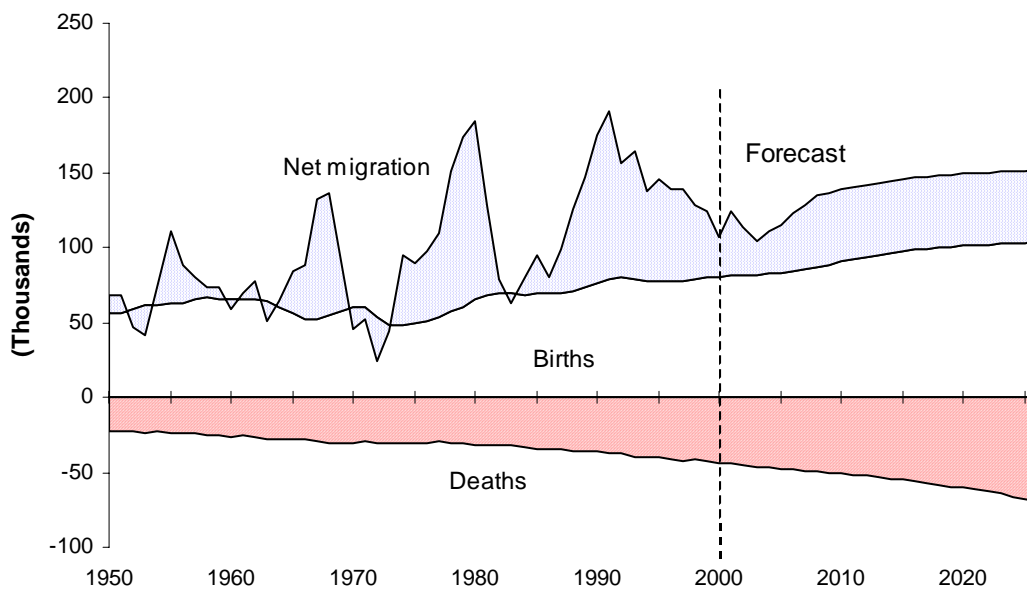
CHAPTER 1

Long-Term Forecasts of Washington Population and Net Migration

THE POPULATION PROJECTION is an integrated part of the long-term forecast for Washington labor force, employment, and income. Population growth contributes to economic growth in the state by making available the labor needed for production, and by expanding the demand for goods and services.

Long-term population growth results from the combined effects of two sources of population change: natural increase and net migration. Natural increase is the excess of births over deaths, and net migration is the difference between in-migration and out-migration.

Figure 1-1
Components of Population Change: Washington



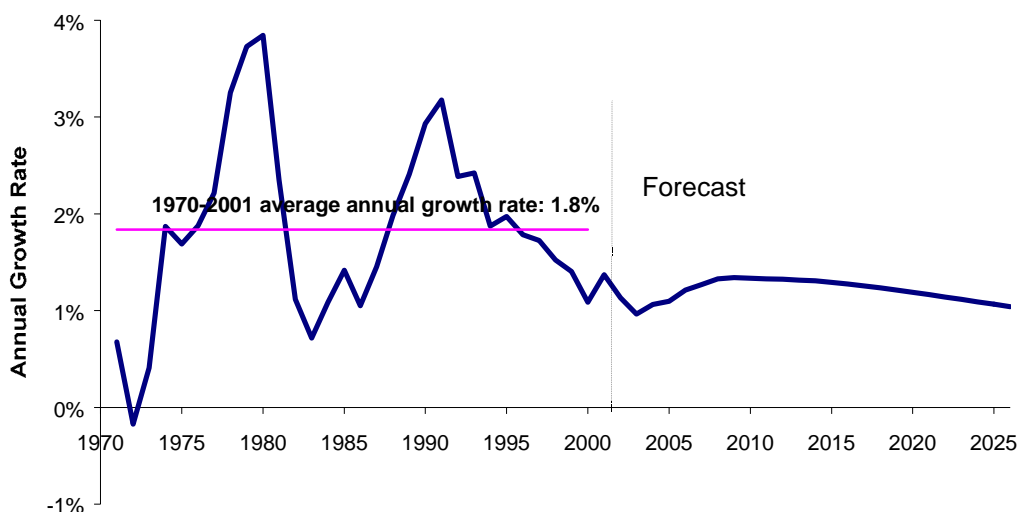
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Between 1970 and 2001, population in Washington grew 75 percent from 3.4 to 6.0 million, averaging 1.8 percent per year. However, the year-to-year changes fluctuated widely, ranging from a high of 3.8 percent in the 1979-80 period to the 1971-72 low of negative 0.2 percent. Net migration, which responds to changing economic conditions, accounted for most of the ups and downs in the yearly state population figures (Figure 1-1). Change in the number of births over time depends on the growth, age structure, and fertility rate of the population. The long-term trend of births in Washington reflects long, generational waves of socioeconomic change including the Great Depression, the post World War II baby boom, the baby bust of the 1970s, and the baby boom echo of the 1980s.

Washington population grew steadily in the second half of the 1980s and peaked in 1990. Between 1990 and 1993, the state population growth remained high at a 2.8 percent annual rate. In the rest of the decade, however, the state population growth slowed to 1.6 percent per year. By 2001, about 6.0 million people lived in Washington State. Over the next 25 years, the state population is expected to grow at an annual rate of 1.2 percent (Figure 1-2), reaching a total of 8.1 million by the year 2026. Net migration will continue to play a major role in the state population growth.

Figure 1-2
Population Growth: Washington, 1970-2026



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Net Migration

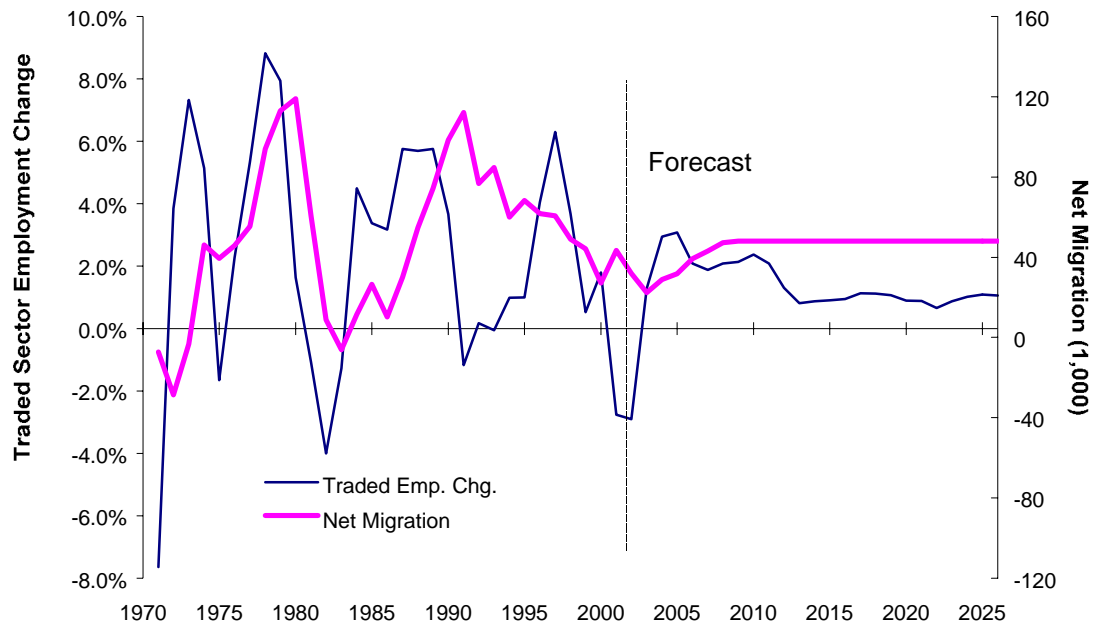
People move into or out of Washington for a variety of reasons. Non-economic factors such as movements of military personnel, retirement migration (principally persons over age 65), and pursuing social and natural amenities account for only a small portion of net migration. The majority of interstate population movements are due to relative changes in the labor market and economic conditions among the states. An expanding economy and labor market tends to “pull” people into an area. Conversely, a contracting economy and labor market tends to “push” people out of it. Net migration is the difference between out-migration and in-migration. These “push” and “pull” factors have made net migration the major contributor to population change in Washington.

The effects of the “push” and “pull” factors are evident in the historical net migration pattern for Washington State. For example, large population increases due to net migration occurred as a result of rapid economic expansions in Washington during the late 1970s and again in the late 1980s. When the state economy slumped in 1970-73 and 1981-83, net migration dropped sharply; in several of those years there was actually negative net migration.

In the first half of the 1990s, the slowing of economic growth in the state lowered the level of net migration and thus restrained population growth, but not to the same extent as in the past. One major reason is that employment growth in Washington still remained in positive territory during the 1990-91 U.S. recession. This made Washington relatively attractive to those seeking jobs, compared to other states that were losing employment. The relative strength of the Washington economy compared to the rest of the U.S. helped “pull” more job seekers into the state. In addition, California, which experienced a steep decline in employment starting about the same time as the U.S. recession, remained in recession well into 1993. Even though Washington experienced a significant reduction in aerospace jobs beginning in 1991, the overall Washington economy continued to perform much better than the California economy. Between 1990 and 1994, California experienced net out-migration of over 400,000 persons per year. Washington received a significant amount of these Californian out-migrants. These two factors, among others, contributed to fairly high levels of net migration for Washington during the early 1990s, even when the state’s economy slowed down significantly.

The picture, however, has reversed in the past five years. From 1995 to 2000, while state economic growth picked up pace, so did the U.S. and the Californian economies. As a result, the level of net migration dropped steadily (Figure 1-3).

Figure 1-3
Net Migration and Traded Sectors Employment Change



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Change in “traded sector” employment has been the major determinant of the Washington net migration. The traded sectors of the state economy include manufacturing, civilian federal government, and producer services (services purchased by other businesses and government agencies). These industries are considered “traded” because they bring revenue and income into

the state. For example, most of the aluminum produced in Washington is fabricated into consumer products by out-of-the-state businesses.

The traded industries usually demand special worker skills that cannot be sufficiently supplied from the local labor pool. Companies in the traded sectors thus constantly recruit workers, especially professionals, from the national labor market. During expansionary periods, new positions created in the state's traded industries very likely require specialized skills or experience that are in short supply among existing Washington worker pool. For example, to increase development and production to the desired levels, the Boeing Company may require as many as 3,000 additional aerospace engineers in a single year. If this amount of extra engineers is not readily available in the state, they will have to come from elsewhere in the country or even from overseas.

Traded sector jobs also tend to be high wage jobs, which is another incentive to attract workers from outside the state. High wages not only induce people to change jobs, they also help cover the costs of interstate relocation. Cost is a critical concern especially if in-migrating workers need to bring family members with them. In short, when Washington's traded sectors expand, net migration increases, and when these sectors decline net migration falls.

Net migration has a significant impact on the size of the state labor force. Since a majority of in-migration to Washington is associated with employment opportunities, these economic migrants tend to be active labor market participants for a long span of time, therefore contributing to the growth of the Washington labor force. Also, gross (i.e., in- plus out-) flow of migration is generally 5 to 10 times the magnitude of net migration; this is the reason why many public and private business operations (e.g., issuance of driver's license, rental housing, etc.) are strongly affected by the level of net migration.

Forecast of Net Migration

The methodology used to forecast net migration includes two steps. First, the Office of Financial Management (OFM) and the Employment Security Department (ESD) jointly develop a forecast of employment for the traded sectors. This initial forecast is based on a system of equations determining employment in each of the 17 manufacturing sectors, the federal civilian sector, and the producer services sector. The producer services sector consists of business services, legal services, engineering, accounting, research, management, and related services.

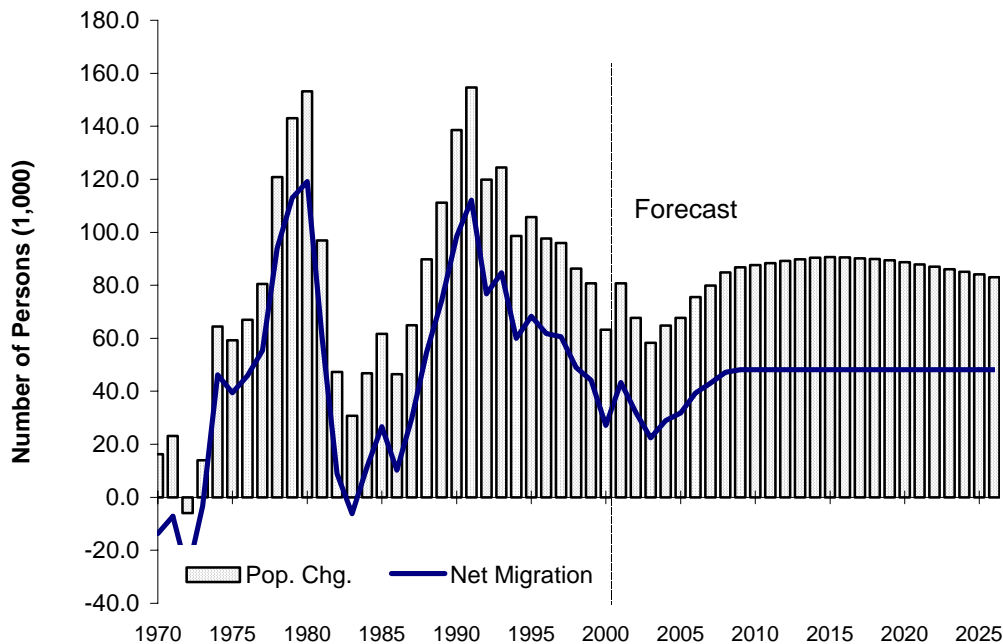
Next, a single equation model is used which treats Washington net migration as a function of traded sector job growth within the state relative to economic conditions in the rest of the country and California. The specific factors included in the model to determine levels of Washington net migration are:

- **The percentage change in Washington's traded sector employment relative to the percentage change in traded sector employment in the U.S.** (The U.S. forecast is from Data Resources Incorporated [DRI] Summer 2001 long-term trend forecast.)

- **The percentage change in Washington's traded sector employment relative to the percentage change in traded sector employment in California.** (The California forecast was obtained from the DRI's Regional Services.)
- **The national unemployment rate.**

Net migration for Washington over the next 25 years is predicted to maintain an average of about 44,400 persons per year, about the same as the historical average of 44,700 per year between 1970 and 2001. The level of net migration, however, varies over the forecast period. Net migration is predicted to remain low during 2001-05, and then gradually increase to settle on a stable, long-term level of around 48,100 per year through 2020. (Population statistics, including net migration, are shown in Table 1-1 at the end of this chapter.)

Figure 1-4
Net Migration and Population Change



The main reason that Washington's net migration is expected to sustain at the historical average is that Washington's traded sectors are expected to maintain healthier growth than their national counterparts over the forecast period. For example, the forecast calls for manufacturing employment to grow modestly in Washington over the next 25 years, whereas manufacturing employment in the U.S. is projected to gradually decline.

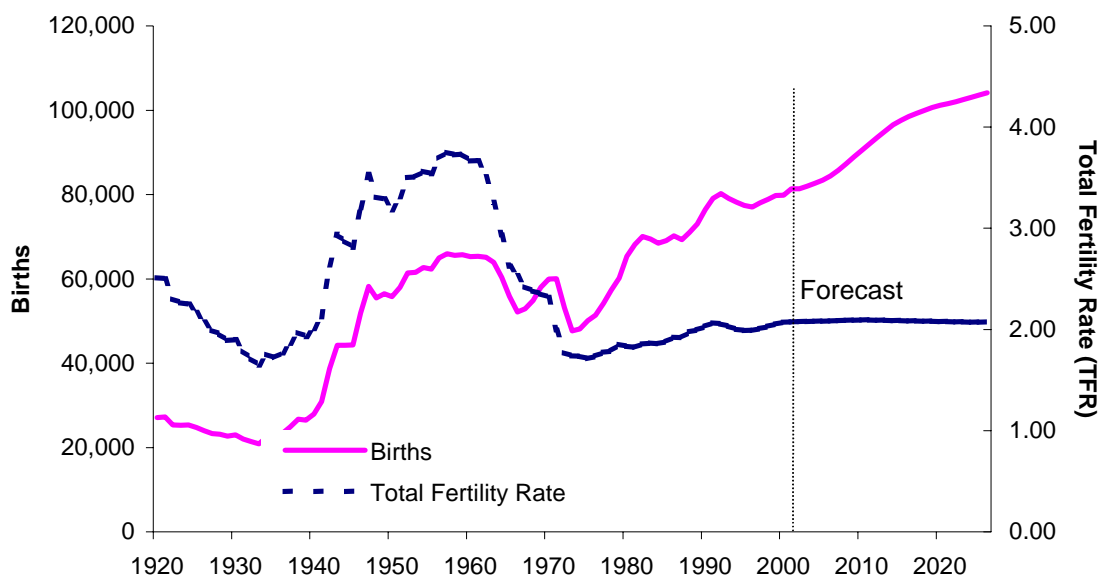
The net migration forecast, once completed, is incorporated in the demographic model for the long-term projection of state total population.

Natural Increase

Natural increase is the second component of population growth. Natural changes include additions to the population through births, and reductions from the population due to deaths. The state's natural population increase is forecast to average 38,900 a year between 2001 and 2026.

The total fertility rate in Washington, which represents the estimated average number of births to women in their childbearing years, is expected to reach and remain at a replacement level of 2.1 births per woman through the end of the forecast period (Figure 1-5). This is somewhat above the all-time low of 1.6 births per woman in 1933, but far below the peak of 3.7 births per woman in 1957. The fertility rate is not expected to rise significantly, in part because of the increasing labor force participation rate for women of childbearing age. (See next chapter.) Also, compared to earlier generations, women are marrying later, having births later, are more likely to live independently, and are spending more time on education. These factors, in combination with technological advancements in birth control, tend to lower the fertility rate.

Figure 1-5
Births and the Total Fertility Rate: Washington



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While the fertility rate is expected to remain fairly stable throughout the forecast period, the number of women of childbearing age is predicted to grow steadily. As a result, the annual number of births in Washington is expected to increase from 81,400 in 2000-01 to about 104,100 in 2025-26.

By definition, the labor force includes only those age 16 and older. Births have a delayed effect on labor force growth, as individuals born today will be potential members of the labor force in

16 years. This implies that recent population changes due to births will affect the labor force in the latter years of the forecast period. For example, anyone born in 1995 will be old enough to enter the labor force in 2011. Similarly, births over the past 16 years are closely associated with the labor force growth in the 2001-2017 period. Although the annual number of births in Washington during the early 1970s dropped to less than 50,000, the number of births rebounded to 70,100 in 1982. By 1990 the annual number of births in the state had increased to 76,400. As explained above, the increased births in the 1980s and 1990s will contribute to the growth of the state workforce over the next two decades.

Mortality, the other component of natural increase, will also rise throughout the forecast period. Life expectancy increased rapidly between 1920 and 1960 and continued to improve through the 1980s, albeit at a much slower pace. Since a lot of the improvements have been achieved in the prevention of infant deaths, future substantial improvement in life expectancy at birth is unlikely.

The forecast calls for both male and female life expectancy in Washington to continue to improve at a slow but steady rate. As in the nation as a whole, the state's population will be aging. Higher mortality rates associated with an aging population will more than offset the improving life expectancy, leading to rising aggregate death rates. The proportion of all deaths due to deaths of the elderly will increase during the forecast period. This suggests that mortality will not have a major impact on labor force growth in the forecast period, because most of the deaths will occur at ages when individuals are unlikely to be in the labor force.

Over the next few decades, aging of the population, both in the state and throughout the nation, will be a profound demographic phenomenon. In Washington State, people 65 years of age and older will account for a growing share of population, from 11.2 percent in 2001 to 18.5 percent in 2026 (Figure 1-6). The trend will have widespread economic and public policy implications ranging from the expanding demand for personal and health services at the local level to increasing pressure on the federal Social Security and medical insurance programs.

Table 1-1 on page 11 shows the historical and projected Washington population trend, and the components of population change.

Figure 1-6
Aging of Population: Washington

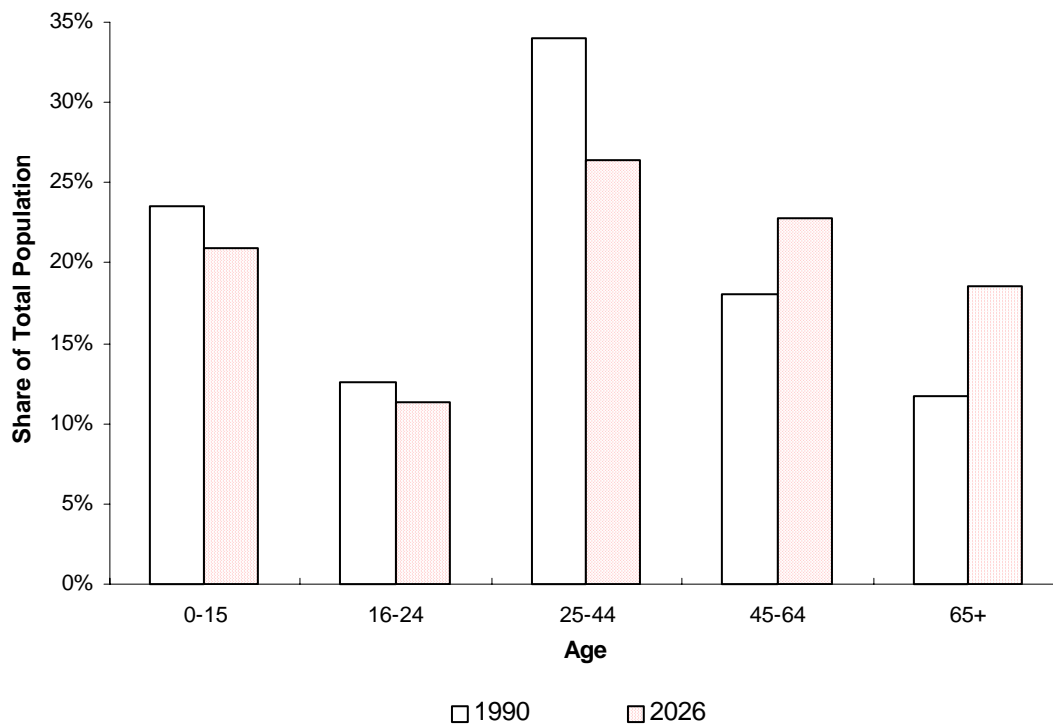


Table 1-1

Components of Population Change: 1990 – 2026

Period	Population End of Period	Population Change		Births		Deaths		Natural Increase	Net Migration	
		Number	%	Number	Rate *	Number	Rate *		Number	Rate *
1989-1990	4,866,700	138,600	2.93	76,400	15.93	36,200	7.55	40,100	98,500	20.53
1990-1991	5,021,300	154,600	3.18	79,100	15.99	36,600	7.40	42,500	112,100	22.68
1991-1992	5,141,200	119,800	2.39	80,200	15.79	37,200	7.31	43,000	76,800	15.11
1992-1993	5,265,700	124,500	2.42	79,100	15.20	39,400	7.56	39,700	84,800	16.29
1993-1994	5,364,300	98,700	1.87	78,200	14.71	39,500	7.44	38,700	60,000	11.29
1994-1995	5,470,100	105,800	1.97	77,500	14.30	40,000	7.38	37,500	68,300	12.60
1995-1996	5,567,800	97,700	1.79	77,000	13.95	41,200	7.46	35,800	61,800	11.20
1996-1997	5,663,800	96,000	1.72	78,000	13.90	42,600	7.59	35,400	60,600	10.79
1997-1998	5,750,000	86,300	1.52	78,800	13.81	41,600	7.28	37,200	49,000	8.59
1998-2000	5,830,800	80,800	1.41	79,800	13.77	43,100	7.45	36,700	44,200	7.63
2000-2000	5,894,100	63,300	1.09	79,900	13.62	43,700	7.46	36,200	27,200	4.64
2000-2001	5,974,900	80,800	1.37	81,400	13.71	44,000	7.41	37,400	43,400	7.31
2001-2002	6,042,600	67,700	1.13	81,300	13.54	45,600	7.59	35,700	32,000	5.33
2002-2003	6,100,900	58,200	0.96	82,000	13.50	46,100	7.60	35,900	22,400	3.69
2003-2004	6,165,700	64,800	1.06	82,700	13.48	46,800	7.64	35,900	29,000	4.73
2004-2005	6,233,300	67,700	1.10	83,400	13.46	47,600	7.68	35,800	31,800	5.13
2005-2006	6,308,800	75,500	1.21	84,400	13.46	48,200	7.69	36,200	39,300	6.27
2006-2007	6,388,800	80,000	1.27	85,800	13.51	48,900	7.70	36,900	43,100	6.79
2007-2008	6,473,700	84,900	1.33	87,300	13.57	49,600	7.71	37,700	47,200	7.34
2008-2009	6,560,500	86,800	1.34	88,900	13.65	50,300	7.71	38,600	48,100	7.38
2009-2010	6,648,100	87,600	1.34	90,500	13.70	51,000	7.72	39,500	48,100	7.28
2010-2011	6,736,500	88,400	1.33	92,000	13.75	51,800	7.73	40,200	48,100	7.19
2011-2012	6,825,600	89,200	1.32	93,600	13.80	52,500	7.75	41,100	48,100	7.09
2012-2013	6,915,500	89,800	1.32	95,100	13.84	53,400	7.77	41,700	48,100	7.00
2013-2014	7,005,900	90,400	1.31	96,600	13.87	54,200	7.79	42,400	48,100	6.91
2014-2015	7,096,500	90,600	1.29	97,600	13.85	55,100	7.82	42,500	48,100	6.82
2015-2016	7,187,000	90,500	1.28	98,500	13.80	56,100	7.86	42,400	48,100	6.74
2016-2017	7,277,200	90,200	1.26	99,300	13.73	57,100	7.90	42,200	48,100	6.65
2017-2018	7,367,100	89,900	1.23	100,000	13.65	58,200	7.95	41,800	48,100	6.57
2018-2019	7,456,500	89,400	1.21	100,600	13.58	59,300	8.00	41,300	48,100	6.49
2019-2020	7,545,300	88,800	1.19	101,200	13.49	60,500	8.07	40,700	48,100	6.41
2020-2021	7,633,100	87,900	1.16	101,600	13.38	61,800	8.15	39,800	48,100	6.34
2021-2022	7,720,100	87,000	1.14	102,000	13.29	63,100	8.23	38,900	48,100	6.27
2022-2023	7,806,200	86,100	1.11	102,500	13.21	64,600	8.32	37,900	48,100	6.20
2023-2024	7,891,300	85,100	1.09	103,100	13.13	66,000	8.41	37,100	48,100	6.13
2024-2025	7,975,500	84,100	1.07	103,600	13.06	67,600	8.52	36,000	48,100	6.06
2025-2026	8,058,500	83,100	1.04	104,100	12.99	69,200	8.63	34,900	48,100	6.00
1980-1990		734,300		705,300		339,800		365,000	369,200	
1990-2000		1,027,500		787,600		404,900		382,700	644,800	
2000-2010		754,000		847,700		478,100		369,600	384,400	
2010-2020		897,200		974,500		558,200		416,300	481,000	
2020-2026		513,300		616,900		392,300		224,600	288,600	
2000-2026		2,164,500		2,439,100		1,428,600		1,010,500	1,154,000	

*Rates are calculated per 1,000-midpoint population.

SOURCES: Forecasts of the State Population: November 2001 Forecast, Washington State Office of Financial Management.



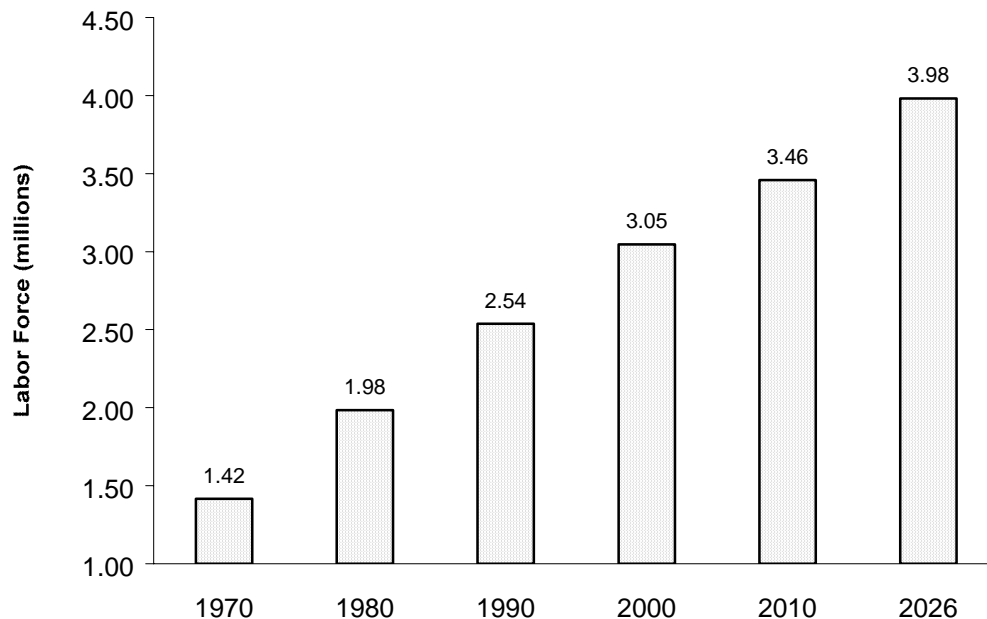
CHAPTER 2

Long-Term Forecast Of the Washington Labor Force

BETWEEN 1970 AND 2001, total labor force* in Washington more than doubled from 1.41 million to 3.1 million. The state is expected to gain an additional one million workers in the following 25 years and, by the year 2026, have a workforce of 4.0 million. The forecast represents a 1.1 percent average annual growth rate for the state labor force from 2001 to 2026, less than half the pace of the 2.6 percent annual growth in the past three decades.

In the first half of the 1990s, labor force in the state grew 2.1 percent per year. The growth accelerated to a 2.6 percent annual rate in the 1995-98 period, but then barely increased in the next three years. The forecast for the next five years, from 2001 to 2006, calls for a moderate recovery of annual growth to 1.4 percent.

**Figure 2-1
Washington Labor Force Growth**



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*As used in this report, the term "labor force" refers to the *civilian non-institutional labor force*, which is composed of individuals age 16 or over who are currently employed (either part-time or full-time) or who are actively seeking employment. Individuals who are in nursing homes, prison, or the military (referred to as the institutional population) are not considered to be either in the civilian labor force or part of the base population from which the labor force is drawn. Other individuals who are not in the civilian labor force are those who are not employed *and* not seeking employment. Common reasons for not being in the labor force include retirement, ill health or injury, attending school, or doing housework at home.

In the next 25 years, Washington's labor force growth will decelerate. The state's workforce is expected to increase at a 1.4 percent annual rate from 2001 to 2010, after which the growth rate will decline considerably to an annual average of 0.9 percent between 2010 and 2026.

The slowdown in labor force growth is a national phenomenon related to the aging of the population. Since labor is a critical factor of production, the slowdown in labor force growth will dampen the growth of economy. This is a particularly important concern because, after 2010, the baby boom generation will start entering retirement en masse and drawing Social Security and Medicare benefits. The quickly growing retiree and elderly population will have to be supported by a labor force that increases relatively slowly. Besides the ongoing Social Security reform efforts, it is anticipated that future productivity increases will accelerate to offset the drag exerted by the slowing labor force growth.

The most demanded labor skills in the future will be those required by growth industries such as information processing and telecommunication, automated tools and equipment, and knowledge-based service businesses. In addition, as the economy becomes more dynamic, future labor market participants need to be able to promptly adapt to the quick-changing working environment. Also, as firms constantly restructure to improve operating efficiency and market competitiveness, future workers should anticipate job changes many times in their careers.

On the other hand, there will be increasing demand for "local services" that produce job opportunities for low- or moderate-skilled workers. Demand for these services will be stimulated by an increasing number of multi-earner households and the aging of the baby boomers. These services are much less susceptible to the competition of foreign imports.

The future labor force will be more diversified. In 2026, non-white workers will account for 15.4 percent of total labor force in Washington, compared to the 8.5 percent share in 1990. By 2026, 16.3 percent of the state's workforce will be Hispanic, more than four folds the 3.7 percent share in 1990. In addition, over the next two-and-a-half decades, female labor force in the state will increase 33.1 percent, compared to the 27.8 percent growth for male workers.

The size and composition of the Washington labor force is determined by three major factors:

- (1) Natural population changes – aging, births, and deaths.
- (2) Net-migration – difference in the number of persons entering and leaving the state.
- (3) Labor force participation rates – proportion of people 16 years of age and older who are employed or seeking employment.

The following sections explore the future changes of these factors and their implications in shaping the state's workforce.

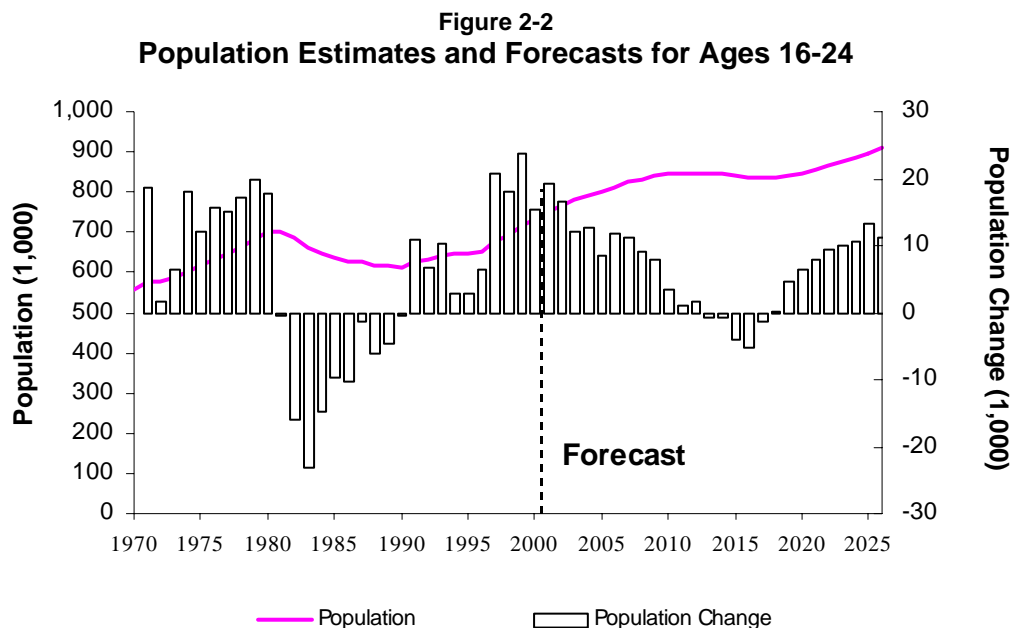
Population Change and Labor Force Growth

Population growth in the state directly contributes to its labor pool. From 1970 to 2001, the number of persons 16 years old and over grew at an annual rate of 2.2 percent in Washington, significantly higher than the 1.3 percent annual rate for the nation. As a result, the state's labor force grew 2.6 percent per year between 1970 and 2001, far outpacing the 1.8 percent average growth rate for the U.S. during the same period.

Population growth in the state is expected to slow to 1.2 percent per year between 2001 and 2026; similar growth rate is projected for the Washington labor force during the period. The forecasted growth for the state's labor force is still much higher than the projected 0.8 percent annual increase for the nation as a whole.

People in the 16 to 24 age group account for a majority of new labor market entrants. In Washington State, high growth of youth population in the late 1990s will lead to significant additions of new workers to the state's labor pool in the near term. The state's population in this age cohort actually declined throughout the decade of the 1980s (Figure 2-2), due to lower birth rates beginning in the mid-1960s. Consequently, in 1990 this age group accounted for only 16.6 percent of the state labor force, substantially lower than the 35.0 percent share in 1980.

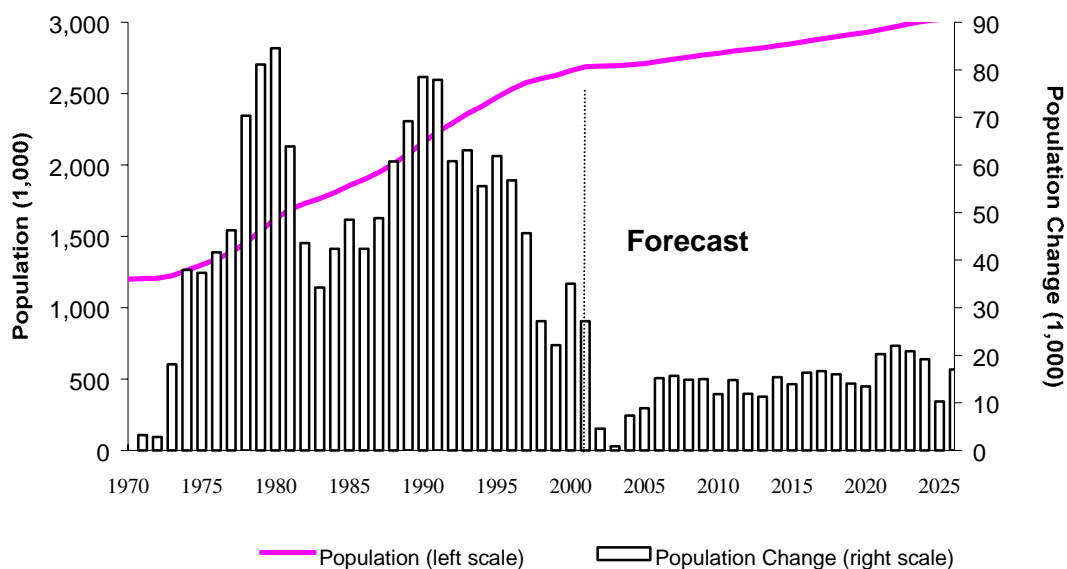
Starting in the early 1990s, the 16-24 population began to grow again, although very slowly. Population growth in this age group accelerated in the second half of the 1990s and, by the turn of the century, approached the high growth reached in the 1970s. Growth of this age group in the state will once again start declining in the second half of the 2000s.



Shifting age structure is a major factor leading to the anticipated slowdown in the growth of the Washington labor force. In the next 25 years, a large portion of the projected population growth will occur in the age groups with low labor force participation rates, thus depressing total labor force participation and workforce growth. The state's 25 to 54 year old population, the most active labor force participants, grew an average of 2.6 percent, or 48,000 persons, per year between 1970 and 2001. In contrast, population growth in this age group will drop substantially to an annual average of 13,900 persons over the forecast period.

The forecast shows that annual growth rate of the 25 to 54 age group in the state will drop to 0.5 percent over the next two-and-a-half decades, far below the growth rates of 2.9 percent and 2.0 percent per year in the 1980s and the 1990s, respectively (Figure 2-3).

Figure 2-3
Population Estimates and Forecasts for Ages 25-54



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Migration

Migration affects the labor force in two ways: first, it is an important contributor to population change, and thus labor force growth; second, most of the migrants are young workers with a long-term attachment to the labor force. In the past 25 years, net migration in the state averaged 48,100 per year, directly accounting for about 60 percent of state yearly population growth. Over the forecast horizon, net migration is expected to remain at a level compatible with historical average, due mainly to continued strengths in the state's manufacturing and other traded sector jobs:

- Manufacturing employment in Washington is projected to grow slightly, compared to the forecasted decline in the U.S. Manufacturing jobs offer above-average wages and support a variety of other jobs in the economy. Strength in the state's manufacturing sector will help stimulate the demand for labor and thus labor-related in-migration.
- Business services will continue to grow at a healthy pace, although not at the same rapid rate as in the late 1980s and the 1990s. Most of the fast-growing business services industries recruit from national or international labor pools; thus, their growth is expected to attract labor from outside the state.
- There have been an increasing number of migrants over age 65 to Washington. Migration decisions of senior citizens are mainly determined by quality of life, amenities, and services available at the destination places. Senior migrants affect the state labor market differently than job-related migrants. On one hand, they are not competing for job opportunities; on the other hand, their assets and incomes contribute to the local economy and the demand for labor. Senior citizens are intensive users of public and private services, thus stimulating employment growth in these sectors. Nationwide, the proportion of total population that is retired or over age 65 is expected to increase significantly throughout the forecast period, suggesting that a growing portion of in-migrants will be retired or over age 65.

As a result of the aforementioned economic and non-economic forces, net-migration between 2001 and 2026 will total 1.11 million persons, averaging about 44,400 per year, slightly below the 49,600 annual average of the past 30 years.

Changes in Labor Force Participation

Labor force participation rates in Washington State historically have been higher than the national average, due in large part to a higher concentration of young people who are active labor market participants. From 1970 to 2001, the state's aggregate labor force participation rate increased from 61.5 percent to 68.3 percent. During this period, the male labor force participation rate gradually declined, while the female labor force participation rate rose considerably. By 2026, the labor force participation rate in the state is projected to decline to 64.0 percent. Most of the drop will take place after 2010.

The projected decline in labor force participation is due mainly to changes in age composition of the future population. Basically, for both males and females, labor force participation is highest between the ages of 20 and 54; it is somewhat lower for ages 16 to 19 and ages 55 to 64, and is very low for persons in retirement age of 65 and over. Population growth that occurs in age groups with lower labor force participation (e.g., age 65 and over) will not increase the labor force as much as the growth in the high-participation age groups (e.g., age 35 to 44). The changing age structure over time is a major factor that lowers the aggregate labor force participation rate after 2010.

From 2010 to 2026, the proportion of the state population in the older age groups will increase substantially. The elderly people (age 65+) as a share of the total state population will increase from 12.1 percent in 2010 to 18.5 percent in 2026. This has a dampening effect on the labor

force growth since the elderly have much lower labor force participation rates. If the year 2026 population was assumed to have the same age structure as in 2010, the aggregate labor force participation rate for that year would be 69.9 percent, rather than the projected 64.0 percent. In other words, aging of the population alone depresses the state labor force participation rate by 5.9 percentage points.

Table 2-1 shows a comparison of the 1990 Washington labor force and labor force participation rates by age and sex, with the corresponding forecast for 2026.

Table 2-1
Washington Labor Force by Age and Sex, 1990 and 2026

Age	Labor Force				Labor Force Participation Rate		
	1990	2026	1990-2026 Net Additions	Percent Change	1990	2026	1990-2026 Percentage Pt. Difference
<i>All</i>							
16-24	422,120	610,503	188,383	44.6%	71.7%	69.1%	-2.6
25-54	1,844,185	2,611,986	767,801	41.6%	86.6%	87.3%	0.7
55-64	213,746	553,119	339,373	158.8%	56.4%	59.9%	3.5
65+	57,404	205,406	148,003	257.8%	10.5%	14.4%	3.9
Total	2,537,454	3,981,014	1,443,559	56.9%	69.7%	64.0%	-5.7
<i>Male</i>							
16-24	214,839	303,271	88,433	41.2%	73.5%	68.9%	-4.6
25-54	1,005,140	1,378,674	373,535	37.2%	95.4%	91.6%	-3.8
55-64	124,323	296,821	172,497	138.7%	67.5%	64.4%	-3.1
65+	33,798	123,036	89,238	264.0%	14.5%	18.8%	4.3
Total Male	1,378,099	2,101,802	723,703	52.5%	78.1%	68.7%	-9.5
<i>Female</i>							
16-24	207,282	307,232	99,950	48.2%	69.9%	69.3%	-0.6
25-54	839,045	1,233,312	394,267	47.0%	78.1%	83.0%	4.9
55-64	89,423	256,298	166,875	186.6%	45.8%	55.4%	9.6
65+	23,606	82,370	58,764	248.9%	7.6%	10.7%	3.1
Total Female	1,159,355	1,879,212	719,856	62.1%	61.8%	59.5%	-2.3

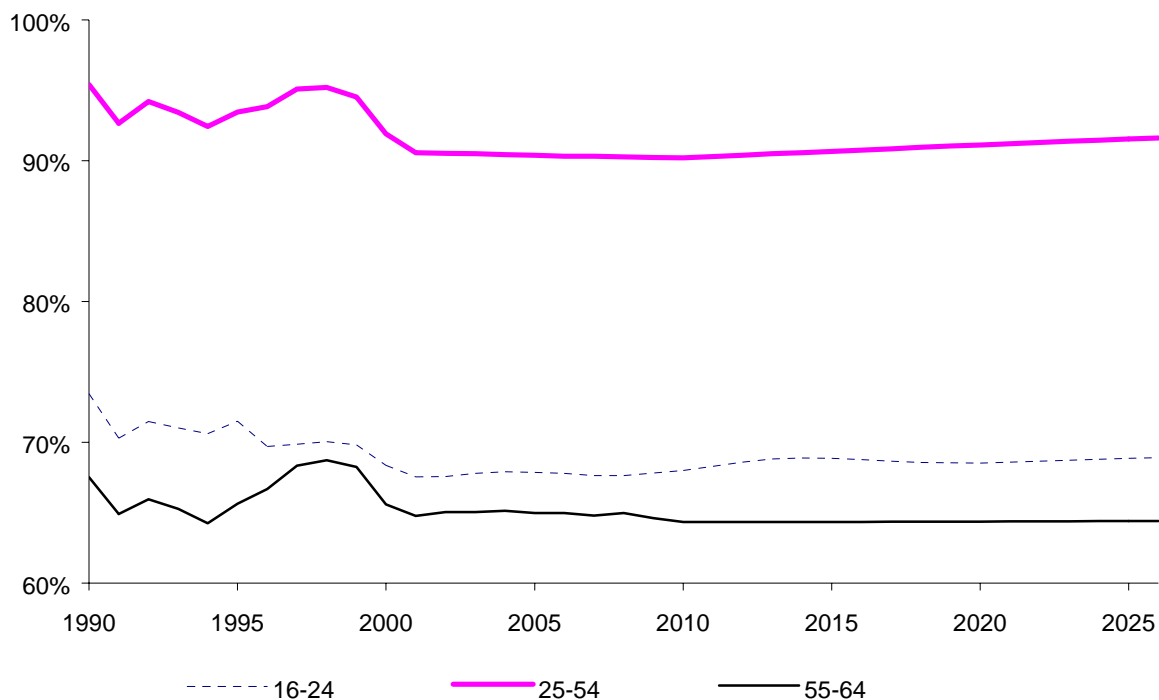
Male Labor Force Participation

The total male labor force participation rate has declined slightly in the past two decades, due primarily to early retirements. Improved retirement options have led to a decline in the labor force participation rates of older men. Generous public and private pension systems and social insurance programs (Social Security, Medicare, and employer-provided health insurance), as well as increases in the wealth and asset incomes of senior citizens have been the contributing factors for choosing early retirement. Nationally, the labor force participation rate of males age 55 to 64 years old dropped from 83.0 percent in 1970 to 67.4 percent in 2001.

In the future, many people over age 65, especially those in the 65-70 age group, will choose to stay in the workforce longer because they lack the economic resources necessary to maintain a desired life style. This is especially the case considering possible retrenchments in Social Security and Medicare benefits. A longer life expectancy also contributes to the need to extend working years. These assumptions have been taken into account in the present labor force forecasts for the state.

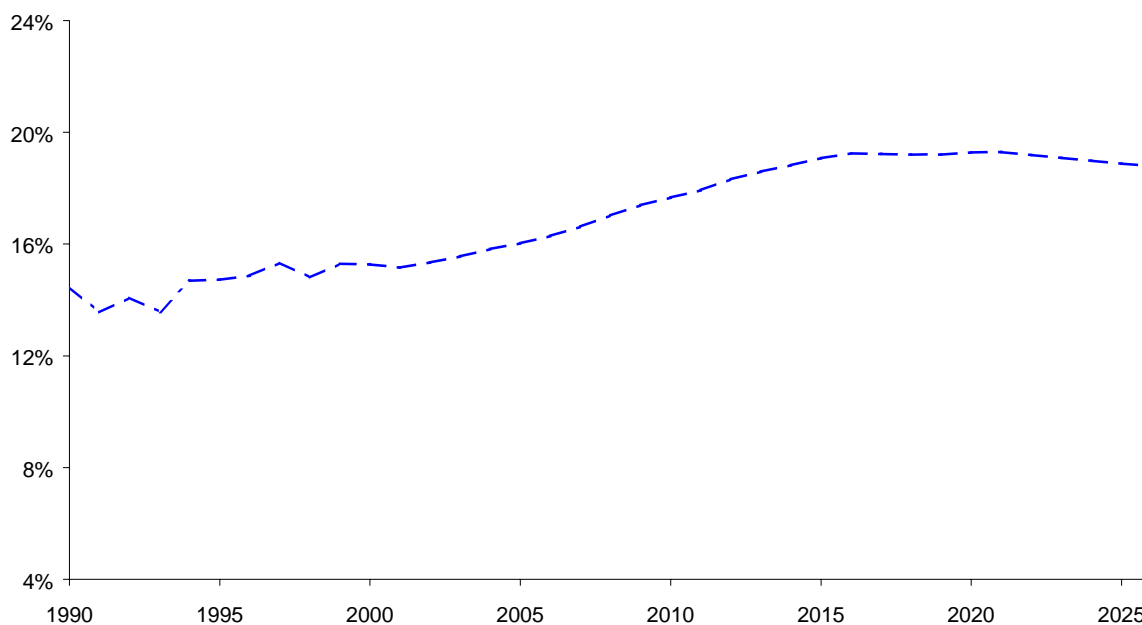
Still, the male labor force participation rate of those in the age of 55-64 is projected to decline from 67.5 percent in 1990 to 64.4 percent by 2026 (Figure 2-4a). The changing racial mix of the labor force – i.e., a higher proportion of the male population will be non-whites with lower labor market attachment – has some negative effect on the aggregate male labor force participation rate.

Figure 2-4a
Washington Male Labor Force Participation Rates (Age 16-64)



Educational attainment is another important reason why an increase in the labor force participation rate of those over age 65 is anticipated (Figure 2-4b). Table 2-2 shows that education achievement is a very significant factor in determining the working status of the elderly. Since people in the 35 to 39 age group in 1990 are three decades removed from the 65 to 69 age cohort in 2020, their educational profile provides a close approximation to the educational achievement of those age 65 to 69 in 2020. Table 2-2 shows that in the future elderly people will have much higher educational levels than those in the same age group in 1990, suggesting a higher labor force participation rate.

Figure 2-4b
Washington Male Labor Force Participation Rate (Age 65+)



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Higher educational levels make it easier for older persons to stay in the labor force. Well-educated persons are more likely to remain in white-collar jobs that have less demand for physical strength, better compensation, and more flexible working schedules than those less educated.

Business cycles also exert significant influence on labor force participation behavior. The male labor force participation rate was affected more than the female rate by the 1990-91 national recession. The downsizing and cost-cutting operations in many large corporations in the early 1990s caused some people to drop out of the labor market entirely and discouraged others from entering the labor market.

Table 2-2
Elderly Labor Force Participation and Education: Washington, 1990

Schooling Completed	Age 65-69 Labor Force Participation Rate	Share of Age 65-69 Population	Share of Age 35-39 Population
1-9 grades	11.1%	11.9%	3.1%
10-12 grades	14.0%	13.4%	5.1%
High school graduate	16.4%	34.2%	23.7%
Some college/Associate	22.5%	24.7%	39.6%
BA and higher	27.4%	15.7%	28.5%
Total	18.7%	100.0%	100.0%

Source: 1990 Census PUMS data file.

Female Labor Force Participation

One of the most significant labor market phenomena in the twentieth century is the increase of women in the workforce. Nationwide, the female labor force participation rate increased from 33.8 percent in 1950 to 57.5 percent in 1990, then reached 60.9 percent in 2001. As a result, the gap between male and female labor force participation rates has narrowed substantially over the past four decades. In 1950, the male labor force participation rate was 53 percentage points above the female rate; by 2001, the gap shrank to 14 percentage points.

Key factors contributing to the trend of rising female labor force participation include increasing levels of education, decisions to delay marriage and childbearing, changing gender roles, availability of market substitutes for housework, and changing technologies that reduce the demand for physical labor. Declining real wages through the past three decades also have contributed: in many households, a second income was needed when the real earnings from the male householders declined.

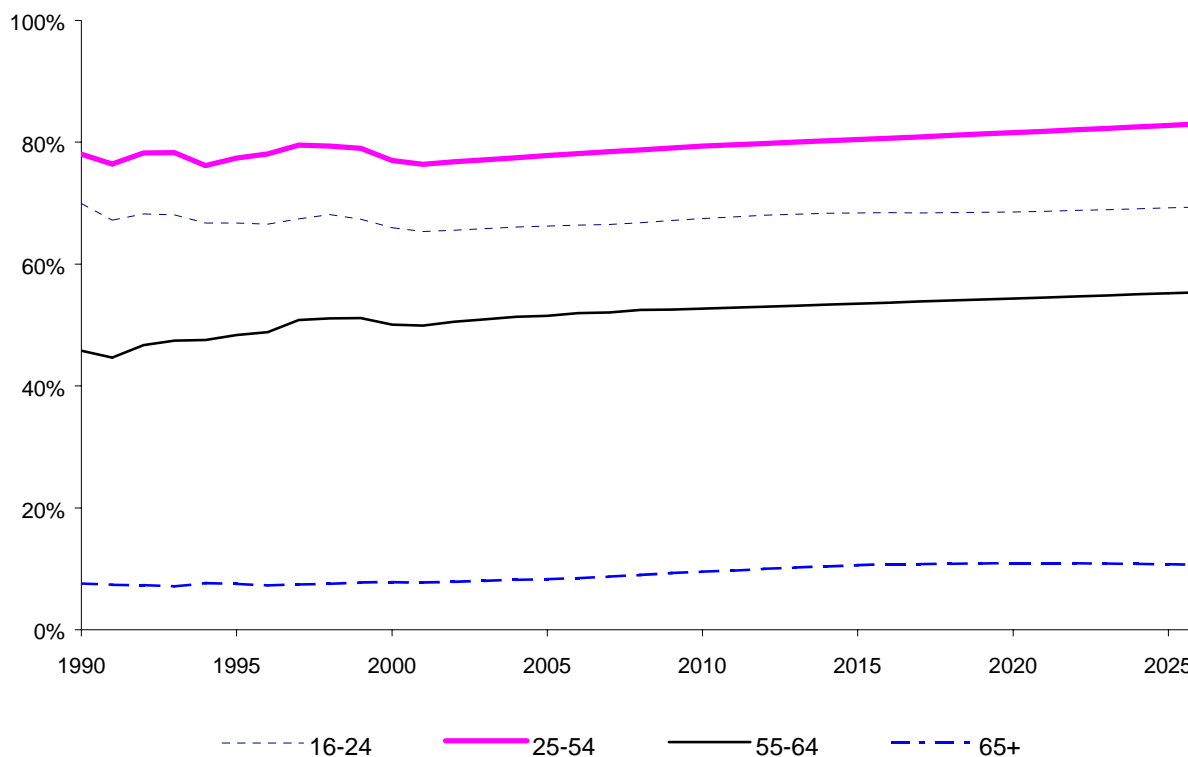
The shifting of female roles from an emphasis on house-keeping to paid jobs outside the home will continue to bring more women into the labor force. Continuing progress in obtaining formal education certainly is going to increase female participation in the labor market. Economic pressures will also continue to drive women into the market workforce, especially for single mothers.

Indeed, the general orientation toward work and overall attachment to the labor force are already roughly comparable for younger men and women. Furthermore, as the demographic forces result in slower labor force growth in the next few decades, employers will increasingly look to women as an important source of labor.

On the other hand, although the long-term trend of rising female participation in the labor force is expected to continue, the increase will slow down. Actually, the pace of increase in female labor force participation began to slow considerably in the mid-1980s as the female rates approached those of males. Gender differences still persist between men and women in terms of

perceived parenting and other family responsibilities. Numerous studies have found that women still bear a disproportionate share of childrearing and housework responsibilities in most families. As a result, woman workers will still experience more frequent and longer spells of time away from jobs than men. This means that female labor force participation is not likely to reach the male rates in the near future. All these considerations are incorporated in the forecast for female labor force participation rates (Figure 2-5).

Figure 2-5
Washington Female Labor Force Participation Rates



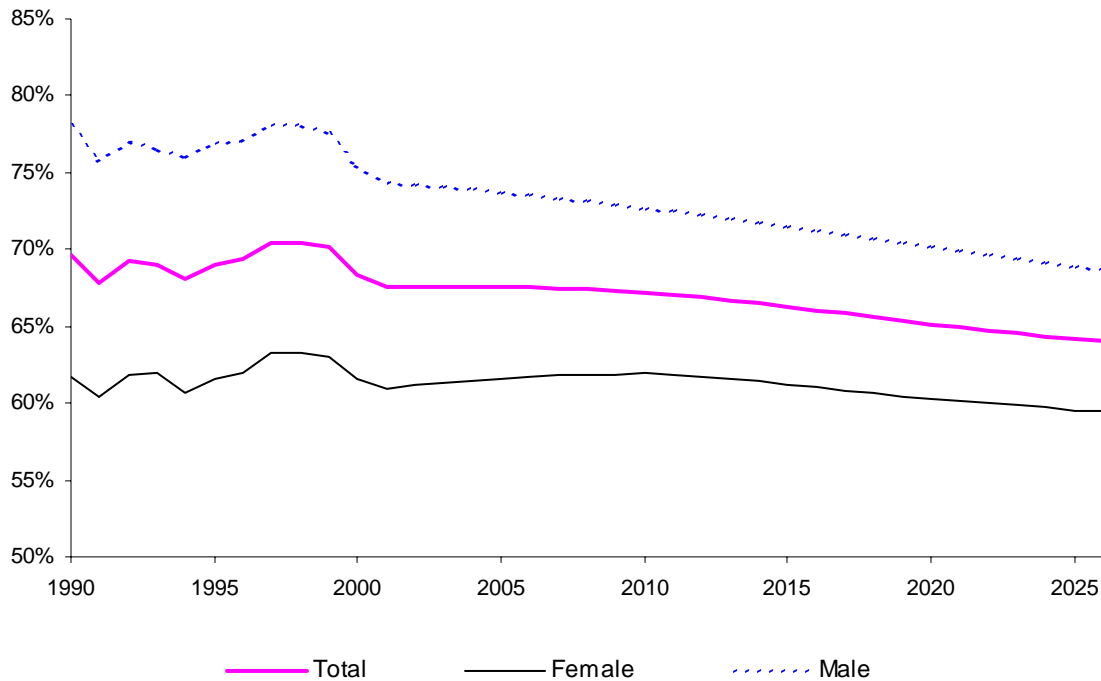
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In summary, the trend of rising female labor force participation will continue, although at a slower pace than in the previous three decades. In Washington State, the overall participation rate of women in the workforce is expected to change little from 61.8 percent in 1990 to 61.9 percent in 2010; then, as a large proportion of the population moves into the age groups with low labor attachment, the rate will decline to 59.5 percent by the year 2026.

As discussed above, changes in the male and female labor force participation rates varied by age and sex. Together, they resulted a slight decline in the state total labor force participation rate from 67.8 percent in 1991 to 67.5 percent in 2001, and then a steady decline to 64.0 percent by 2026.

Figure 2-6
Forecast of Washington Labor Force Participation Rates by Sex



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Forecast of Total Labor Force

The projected changes in labor force participation rates, net migration, natural population increase, and aging of the population will result in a downward trend for the state's labor force growth. Between 1990 and 2000, the Washington labor force grew by 20 percent, representing an average annual growth rate of 1.8 percent. This rate is significantly lower than the 3.0 percent growth per year experienced in the previous two decades. In the decade from 2000 to 2010, the state's labor force growth will slow to 1.3 percent per year, or 13.5 percent total growth for the decade. Looking further into the future, the state's labor force growth is expected to significantly decelerate between 2010 and 2026 as the Baby Boom generation reaches retirement age, growing at an annual rate of 0.9 percent (Table 2-3).

While the Washington labor force will increase at a relatively slow pace over the next 25 years, the growth of the U.S. labor force is expected to be even slower. The major reason for the difference between Washington and U.S. labor force growth is population growth. Between 2001 and 2026, the Washington's population 16 years old and over is forecasted to grow at an annual average rate of 1.3 percent, while the comparable population group for the nation is projected to increase only 0.9 percent per year. The difference is mainly attributed to the state's continuing ability to attract migrants.

Table 2-3
Washington Labor Force Change

Decade	Changes in Labor Force		
	Number (1,000s)	Percent Change (%)	Average Annual Growth (%)
1950-1960	149.8	15.9	5.5
1960-1970	320.1	29.4	2.6
1970-1980	567.5	40.0	3.4
1980-1990	552.9	27.9	2.5
1990-2000	508.3	20.0	1.8
Forecast			
2000-2010	411.8	13.5	1.3
2010-2020	332.6	9.6	0.9
2020-2026	190.8	5.0	0.8

Washington labor force participation rates historically have been slightly above national rates, a tendency which is expected to continue. Table 2-4 provides labor force estimates for Washington between 1980 and 2001, and forecasts through 2026.

The Changing Profile: Aging, Female, and Non-White Workforce

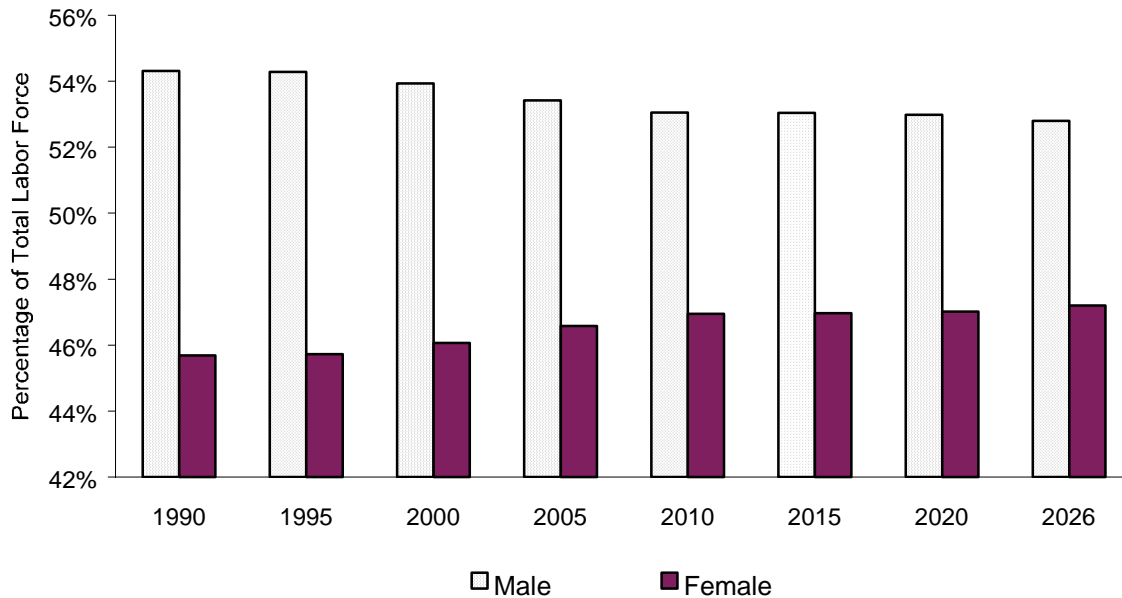
Changes in labor force participation, combined with demographic changes (births, deaths, aging, and migration), will alter the profile of the Washington labor force. The forecast shows that the state workforce will become more and more diversified in terms of age composition, sex, and racial mixes. These trends parallel those projected for the nation's workforce.

Higher Proportion of Women in the Labor Force

Over the forecast period, the slow but steady increases in labor force participation by women, combined with a gradual decline in male labor force participation, will increase the female share of the total labor force. In 1990, women represented 45.7 percent of the labor force; by 2026 their share will rise to 47.2 percent (Figure 2-7). Women will comprise nearly half of "net additions" to the labor force between 1990 and 2026. "Net additions" is the difference between new entrants to the labor force and those who leave the labor force.

The increasing importance of women as a source of labor will motivate employers to provide benefit programs that accommodate the needs of female workers. Some desirable employee benefits include on-site childcare, flexible work schedules, order and delivery of household goods such as groceries, dry cleaning of clothes, etc. For employers, these work-life benefit programs will be critical to their ability to attract qualified employees, and to raising the productivity of their female workers.

Figure 2-7
Forecast of Washington Labor Force Distribution by Sex



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Aging of Labor Force

Between 2001 and 2026, the number of Washington workers over 55 years old will increase by about 105 percent, while those aged 16 to 54 will increase by only 19 percent (Figure 2-8). Consequently, the age profile of the state labor force in 2026 will be very different from that in 1990. Older persons (55 years old and over) are projected to represent about 19 percent of all Washington labor force in 2026, substantially higher than the 12 percent share in 2001.

As part of the aging process, the workforce will go through an interim “middle-aging” phase. Around the year 2001, middle-aged workers — those 35 to 54 years old — constituted about 50 percent of the labor force, significantly above the 45 percent share just a decade ago. A by-product of the middle aging of the labor force is generational crowding or “mid-career crunch.” The sharp rise of these middle-age workers will lead to an abundant supply of persons qualified for mid-career promotional opportunities, while prolonged staying of top-level, older workers may diminish the prospects of middle-age employees looking for career advancements. One likely result may be increasing job or career changes in the future years.

Table 2-4
Washington Labor Force: Historical and Forecast

Year	Civilian Non-Institutional Population				Labor Force			Labor Force Participation Rate		
	Total Population	Total 16 & Over	Male 16 & Over	Female 16 & Over	Total	Male	Female	Total	Male	Female
1980	4,132,200	3,061,000	1,479,700	1,581,200	1,984,600	1,157,200	827,400	64.8	78.2	52.3
1981	4,229,300	3,128,100	1,511,000	1,617,100	1,996,800	1,158,300	838,500	63.8	76.7	51.9
1982	4,276,500	3,166,500	1,530,300	1,636,100	2,024,500	1,160,700	863,700	63.9	75.8	52.8
1983	4,307,200	3,193,200	1,541,600	1,651,600	2,068,400	1,174,300	894,100	64.8	76.2	54.1
1984	4,354,100	3,234,100	1,561,100	1,672,900	2,050,400	1,169,300	881,100	63.4	74.9	52.7
1985	4,415,800	3,282,600	1,584,800	1,697,900	2,090,400	1,181,800	908,600	63.7	74.6	53.5
1986	4,462,200	3,330,300	1,608,900	1,721,400	2,198,500	1,220,700	977,800	66.0	75.9	56.8
1987	4,527,100	3,388,600	1,637,100	1,751,500	2,257,500	1,234,400	1,023,200	66.6	75.4	58.4
1988	4,616,900	3,454,300	1,667,800	1,786,500	2,315,800	1,247,100	1,068,700	67.0	74.8	59.8
1989	4,728,100	3,537,000	1,708,400	1,828,600	2,450,900	1,305,200	1,115,400	69.3	79.4	59.9
1990	4,866,700	3,640,900	1,763,600	1,877,300	2,537,500	1,378,100	1,159,400	69.7	78.1	61.8
1991	5,021,300	3,739,600	1,813,300	1,926,300	2,535,100	1,372,700	1,162,400	67.8	75.7	60.3
1992	5,141,200	3,824,500	1,856,900	1,967,700	2,648,200	1,431,700	1,216,400	69.2	77.1	61.8
1993	5,265,700	3,912,500	1,902,700	2,009,800	2,701,200	1,456,100	1,245,100	69.0	76.5	62.0
1994	5,364,300	3,988,000	1,940,700	2,047,400	2,716,400	1,474,600	1,241,800	68.1	76.0	60.7
1995	5,470,100	4,069,500	1,981,600	2,087,900	2,810,100	1,525,300	1,284,800	69.1	77.0	61.5
1996	5,567,800	4,151,100	2,022,200	2,128,900	2,878,600	1,558,900	1,319,700	69.3	77.1	62.0
1997	5,663,800	4,230,300	2,061,000	2,169,200	2,981,200	1,609,800	1,371,400	70.5	78.1	63.2
1998	5,750,000	4,308,600	2,102,100	2,206,500	3,037,200	1,641,700	1,395,500	70.5	78.1	63.2
1999	5,830,800	4,385,400	2,141,700	2,243,700	3,074,600	1,662,000	1,412,600	70.1	77.6	63.0
2000	5,894,100	4,457,000	2,176,700	2,280,200	3,045,800	1,642,800	1,403,000	68.3	75.5	61.5
2001	5,974,900	4,528,700	2,213,000	2,315,700	3,057,400	1,645,200	1,412,200	67.5	74.3	61.0
Forecast										
2005	6,233,345	4,779,100	2,339,300	2,439,800	3,228,100	1,724,500	1,503,600	67.5	73.7	61.6
2010	6,648,112	5,148,300	2,526,400	2,621,900	3,457,600	1,834,200	1,623,400	67.2	72.6	61.9
2015	7,096,501	5,488,200	2,697,500	2,790,700	3,637,300	1,929,100	1,708,200	66.3	71.5	61.2
2020	7,545,269	5,822,800	2,864,200	2,958,600	3,790,200	2,008,100	1,782,100	65.1	70.1	60.2
2026	8,058,527	6,221,400	3,060,600	3,160,800	3,981,000	2,101,800	1,879,200	64.0	68.7	59.5

Notes:

Total population is based on the November 2001 official Office of Financial Management population estimates and forecasts.

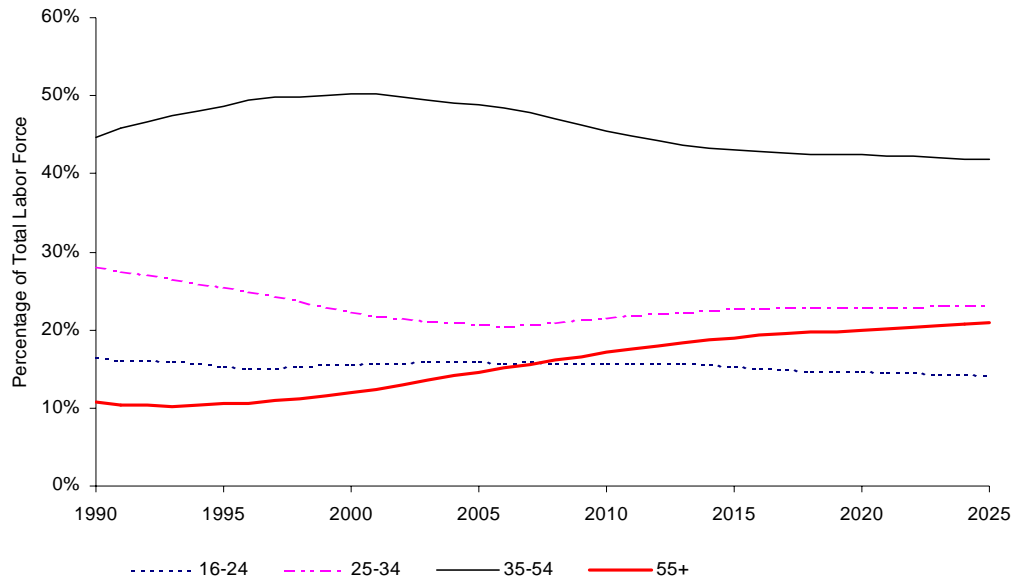
Total population estimates and forecasts are for April 1 of each year.

Estimates/forecasts of civilian non-institutional population, labor force, and labor force participation rate are "annual average" measurements.

Projection of the civilian non-institutional population is based on 1990 proportion of the male and female Washington population participating in the military or residing in prisons, nursing homes, and other institutions.

Labor force participation rates represent the proportion of the civilian non-institutional population that is employed or unemployed based on federal Bureau of Labor Statistics definitions.

Figure 2-8
Age Profile of Washington Labor Force



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The repercussions of the “middle-aging” phenomenon may be further exacerbated during a business downturn when firms accelerate “delaying” management structure and cost cuttings in order to remain competitive in the global economy. This is similar to what happened in the first half of the 1990s, when the flattening or compressing of management structures in firms eliminated large numbers of mid-management positions. Many of these dislocated managers were unable to find employment with compensations comparable to their previous jobs.

The elderly workforce is also characterized by a high proportion of part-time and temporary working arrangements. Today, a lot of workers age 65 and over have part-time jobs, and few of them want to switch to full-time employment. Also, a majority of the elderly workers perceive their current working as temporary, indicating their readiness to change jobs or exit the labor market (for retirement).

The aging of the workforce will present unique challenges to employers. Businesses will need management and personnel practices that can effectively accommodate older employees. Among the challenges will be: (a) establishing new reward and incentive structures as traditional hierarchical promotional opportunities decline; (b) facilitating career or job changes for “squeezed” middle-age or “topped-out” older employees; (c) planning and implementing human resource management to accommodate less predictable retirement age and exits/re-entries of elderly workers; (d) meeting varied demand for employee benefits, e.g. the elderly workers’

preference for long-term care; (e) dealing with increased pressures on retirement systems; and (f) making work more versatile and challenging.

Non-White and Hispanic Workforce

Along with the expected increase of older workers and women in the labor force, non-whites will constitute an increasing share of the Washington labor force in the coming decades. Labor force growth rates for African Americans, Asian Americans, and other non-whites are expected to be considerably higher than the white population. From 2001 to 2026, the non-white labor force in Washington is expected to grow at an annual rate of 1.9 percent, compared to the 0.9 percent and 1.1 percent annual rates for the white and the total labor force, respectively. As a result, non-white workers will account for 25.2 percent of the net labor force growth in the state between 2001 and 2026.

Changing racial composition of the state labor force over time results in higher labor force growth rates for non-whites relative to whites. In 1980, 6.2 percent of the Washington labor force was non-white; in 1990, the share increased to 8.5 percent. Non-whites constituted 12.2 percent of the state's labor force in 2001, and are expected to account for 14.1 percent in 2010, and 15.4 percent by 2026. Table 2-5 shows the changing racial composition of the state labor force.

The main reason for an increasing share of non-whites in the labor force is that the non-white population is expected to grow at a much higher rate than the white population. A second factor is the younger age composition of the non-white population compared to whites. Non-whites are also expected to continue increasing their labor force participation rate.

Another important labor trend, in the state and nationwide, is ethnic diversification. Between 1990 and 2026, workers of Hispanic origin in the state will almost quadruple from 96,700 to 777,000. As a result, Hispanics will account for 19.5 percent of the Washington labor force by 2026, five times the share of 3.8 percent in 1990.

Table 2-5
Labor Force Composition by Race: Washington

Year	Total Labor Force (1000s)	Share of Total Labor Force				
		White	African American	Asian & Other	Total Non-White	Hispanic
1990	2537.5	91.5%	2.7%	5.7%	8.5%	3.8%
1995	2810.1	89.3%	3.1%	7.6%	10.7%	7.1%
2000	3045.8	87.8%	3.4%	8.8%	12.2%	12.1%
2005	3228.1	86.6%	3.6%	9.8%	13.4%	14.0%
2010	3457.6	85.9%	3.8%	10.4%	14.1%	15.5%
2015	3637.3	85.3%	3.8%	10.9%	14.7%	16.9%
2020	3790.2	84.7%	3.9%	11.5%	15.3%	18.4%
2026	3981.0	84.6%	3.8%	11.6%	15.4%	19.5%

The trend toward racial and ethnic diversification poses a critical issue in the effort to elevate worker skills in the future. Today, the average education level of African American workers of every age cohort is far below their white counterparts. The gap has been narrowing, but at a slow pace. The gap for Hispanic workers is even greater. In 1990, only 56.7 percent of the Washington Hispanic population 25 years of age or older completed high school or equivalency, compared to the 85.0 percent rate for the non-Hispanic persons in the same age group. As future economic growth relies more and more on productivity improvement, raising the education levels of these fast-growing racial and ethnic minorities becomes a major policy concern.



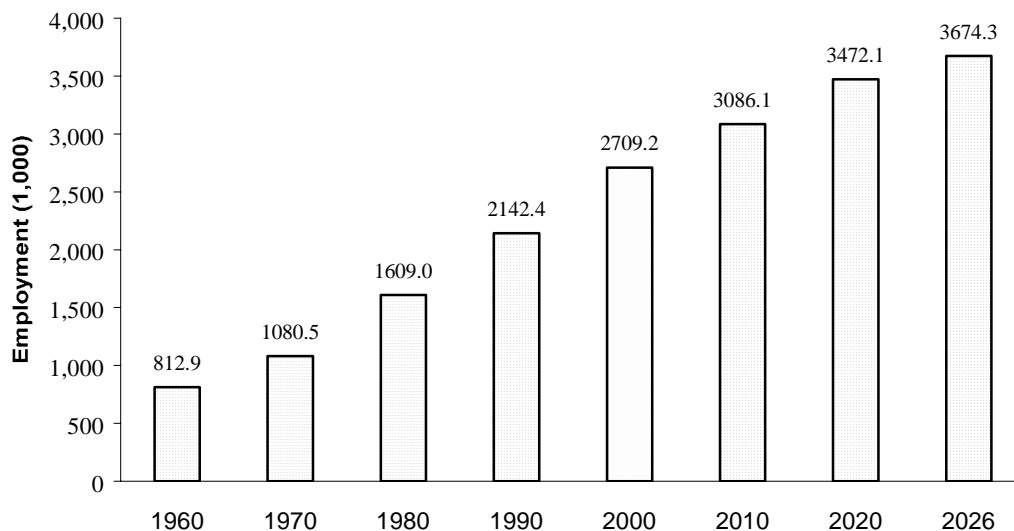
CHAPTER 3

Long-Term Forecast of Washington Wage And Salary Employment

IN 2001, THERE WERE 2.70 MILLION non-agricultural wage and salary jobs¹ in Washington State, about two-and-a-half times the state's employment level in 1970. Employment growth in the state averaged 3.0 percent per year between 1970 and 2001, far above the U.S. average annual rate of 2.1 percent during the same period.

Total Washington non-agricultural wage and salary employment is projected to reach 3.09 million in the year 2010 and 3.67 million by 2026 (Figure 3-1). This represents an average annual growth rate of 1.3 percent from 2001 to 2010, and 1.1 percent from 2010 to 2026. The forecast is reported in Table 3-1. Table 3-2 presents a more detailed, sector-by-sector forecast of wage and salary employment.

Figure 3-1
Washington Total Non-Agricultural Wage and Salary Employment



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¹ The labor market terms used in this chapter have distinctive definitions: The **Labor Force** consists of the employed and the unemployed. It includes only non-institutionalized civilians 16 years of age and older. **Total Employment** is the number of employed persons by place of residence, including the self-employed and persons working in agricultural jobs. Total employment excludes non-civilian military personnel. The **Unemployed** represents the number of persons in a given month who are not working but are actively seeking work, as indicated by unemployment insurance claims and responses to the Current Population Survey. **Non-Agricultural Wage and Salary Employment** describes the number of jobs by place of work in non-agricultural industries in a given month reported by firms in the monthly Current Employment Statistics industry survey. The survey data are then extrapolated to produce an estimate of total industry employment. Non-agricultural wage and salary employment was about 89 percent of total employment in 1995.

Table 3-1
Washington Labor Force and Employment

Year	Labor Force	Total Employed	Unemployed	Unemployment Rate(%)	Total Non-Agricultural Wage & Salary Employment
1970	1,417,100	1,285,900	131,200	9.3	1,080,500
1975	1,562,200	1,412,300	149,800	9.6	1,225,500
1980	1,984,600	1,828,200	156,400	7.9	1,609,000
1981	1,996,800	1,806,000	190,800	9.6	1,612,000
1982	2,024,500	1,778,900	245,600	12.1	1,568,800
1983	2,068,400	1,837,700	230,700	11.2	1,586,000
1984	2,050,400	1,856,900	193,600	9.4	1,659,700
1985	2,090,400	1,920,700	169,600	8.1	1,710,300
1986	2,198,500	2,017,800	180,700	8.2	1,769,900
1987	2,257,500	2,086,800	170,700	7.6	1,851,500
1988	2,315,800	2,172,800	142,900	6.2	1,941,100
1989	2,450,900	2,299,600	151,300	6.2	2,046,300
1990	2,537,500	2,413,000	124,500	4.9	2,142,400
1991	2,535,100	2,372,700	162,400	6.4	2,177,400
1992	2,648,200	2,446,800	201,400	7.6	2,221,900
1993	2,701,200	2,495,600	205,600	7.6	2,251,700
1994	2,716,400	2,542,900	173,500	6.4	2,304,100
1995	2,810,100	2,631,000	179,100	6.4	2,346,800
1996	2,878,600	2,691,600	187,000	6.5	2,415,600
1997	2,981,200	2,839,500	141,700	4.8	2,514,200
1998	3,037,200	2,892,500	144,700	4.8	2,594,700
1999	3,074,600	2,929,200	145,400	4.7	2,648,700
2000	3,045,800	2,887,900	157,900	5.2	2,709,200
2001	3,057,400	2,872,400	185,*00	6.1	2,702,500
Forecast					
2005	3,228,100	3,016,700	211,400	6.5	2,843,400
2010	3,457,600	3,261,100	196,500	5.7	3,086,100
2015	3,637,300	3,448,800	188,500	5.2	3,284,200
2020	3,790,200	3,616,000	174,200	4.6	3,472,100
2026	3,981,000	3,785,900	195,100	4.9	3,674,300
Change					
1970-1980	567,500	542,300	---	---	528,500
1980-1990	552,900	584,800	---	---	533,400
1990-2001	508,300	474,900	---	---	566,800
2001-2010	411,800	373,200	---	---	376,900
2010-2026	523,400	524,800	---	---	588,200
Growth Rates					
1970-1980	3.4%	3.6%	---	---	4.1%
1980-1990	2.5%	2.8%	---	---	2.9%
1990-2001	1.8%	1.8%	---	---	2.4%
2001-2010	1.3%	1.2%	---	---	1.3%
2010-2026	0.9%	0.9%	---	---	1.1%

Long-Term Employment Trends

Three important elements contribute to long-term employment trends. First is growth of the indigenous labor force through births, deaths, and aging. Second is the long-term level of unemployment. And third is the change in the size of the available labor force due to net migration (the difference between workers leaving and entering the state). Growth of the labor force due to net migration, in turn, depends heavily on the strength of the state economy relative to other parts of the country. The long-term labor force forecast in Chapter 2 of this report takes into account all these three elements. Based on these considerations, the Washington labor force is forecasted to increase by about 923,600 between 2001 and 2026.

At any given time, a portion of the labor force is unemployed. Since 1970, the Washington unemployment rate has ranged from a low of 4.7 percent in 1999 to a high of 12.1 percent in 1982. For the most part, the pattern of Washington's unemployment rate has tracked closely with the national business cycles and unemployment rate, but at a level about 1 to 2 percentage points above the national average.

The unemployment rate in Washington has been about 2 to 4 percentage points above the U.S. rate during most economic downturns, but much closer to the U.S. rate during recoveries and expansions. Over the last ten years, however, the difference between Washington's and the U.S. unemployment rates has narrowed. In the 1990s, the Washington-U.S. difference averaged about 0.5 percentage point. The persistent gap between the U.S. and Washington unemployment rates reflects in part the relatively high concentration of seasonal jobs in the state. The gap is also related to the large numbers of in-migrants who are attracted to Washington during economic expansions, which limits reductions in the state's unemployment rate during good economic times.

The Washington economy experienced strong growth in the second half of the 1990s, which drove the state unemployment rate below 5 percent. Between 2001 and 2026, the state unemployment rate is forecasted to gradually decline from 6.0 percent toward the 5 percent level. This implies that the trends and factors contributing to the narrowing gap between the U.S. and Washington unemployment rates will continue. By 2026, there will be 3.79 million employed Washington residents, an increase of about 0.91 million employed persons, or 32 percent, from the 2001 level.

Goods-Producing Employment

Manufacturing will maintain its vital presence in the Washington economy over the next 25 years. Continued growth in capital investment for productivity enhancements, both nationally and internationally, will generate strong demand for goods produced by Washington's "high-tech" manufacturing sectors. In addition, long-term demand for Washington's natural resource products will continue to grow as both the national and international economies expand.

Table 3-2
Washington Non-Agricultural Wage and Salary Employment by Industry

	Actual				Forecast						Average Annual Growth Rates (%)				
	1960	1970	1980	1990	2000	2005	2010	2015	2020	2026	1960-80	1980-90	1990-00	2001-10	2010-26
Manufacturing 1/	216,700	239,500	308,800	369,400	350,800	324,900	345,700	355,500	360,900	364,400	1.8	1.8	-0.5	-0.1	0.3
Non-durable Manufacturing	70,800	74,500	87,600	108,400	107,700	106,400	107,500	109,600	112,800	112,500	1.1	2.2	-0.1	0.0	0.3
Foods & Kindred Products	27,100	29,000	32,000	37,600	41,300	41,500	41,700	41,500	41,900	40,200	0.8	1.6	0.9	0.1	-0.2
Apparel Products	3,700	5,500	6,500	7,900	8,100	6,700	6,800	6,900	7,100	7,100	2.9	2.0	0.3	-1.7	0.3
Paper & Allied Products	17,900	19,800	17,600	18,100	15,600	14,500	14,300	14,000	13,900	13,400	-0.1	0.3	-1.5	-0.9	-0.4
Printing & Publishing	8,700	10,600	15,800	22,500	24,300	24,400	24,300	26,000	27,900	29,400	3.0	3.6	0.8	0.0	1.2
Chemical & Products 1/	10,600	5,900	8,700	13,200	6,100	6,900	7,100	7,400	7,600	7,800	---	---	---	1.5	0.6
Misc. Non-durables	2,800	3,700	7,000	9,000	12,300	12,400	13,300	13,800	14,400	14,600	4.7	2.5	3.2	0.8	0.6
Durable Manufacturing	145,900	165,000	221,200	260,900	243,100	218,400	237,900	245,800	248,300	251,800	2.1	1.7	-0.7	-0.2	0.4
Lumber & Wood Products	44,500	42,200	47,000	39,900	33,000	32,000	33,000	32,700	32,700	31,500	0.3	-1.6	-1.9	0.0	-0.3
Furniture & Fixtures	2,900	3,500	3,300	4,100	4,900	4,200	3,800	3,700	3,600	3,500	0.6	2.2	1.8	-2.5	-0.5
Clay, Glass, Stone Products	5,000	5,800	6,900	7,900	9,100	8,800	9,100	9,100	9,100	8,800	1.6	1.4	1.4	0.0	-0.2
Primary Metals	10,200	14,100	16,700	13,000	11,000	8,700	8,500	7,800	6,900	6,700	2.5	-2.5	-1.7	-2.5	-1.5
Fabricated Metal Products	6,700	7,400	11,700	12,200	15,000	14,900	16,400	16,700	17,000	16,800	2.8	0.4	2.1	0.9	0.2
Non-Electrical Machinery	5,700	10,000	15,000	20,500	25,300	24,600	30,300	30,400	30,700	30,300	5.0	3.2	2.1	1.8	0.0
Electrical Machinery	2,700	4,100	11,200	11,400	20,000	19,000	22,500	24,400	25,500	29,600	7.4	0.2	5.8	1.2	1.7
Aircraft & Parts	57,800	61,500	79,600	116,200	86,200	69,000	73,300	77,600	76,300	75,000	1.6	3.9	-2.9	-1.6	0.1
Other Trans. Equipment	7,800	13,300	18,700	14,800	15,100	12,700	13,500	13,100	13,000	12,900	4.5	-2.3	0.2	-1.1	-0.3
Instruments	---	---	---	14,700	14,700	15,700	17,200	18,500	20,000	21,300	---	---	0.0	1.6	1.3
Miscellaneous Mfg.	---	---	4,600	6,100	8,800	8,800	10,300	11,800	13,500	15,400	---	2.9	3.7	1.6	2.5
Mining	1,800	1,700	3,200	3,700	3,600	3,600	3,900	4,100	4,300	4,500	2.9	1.5	-0.3	0.8	0.9
Construction	44,600	53,400	92,900	117,300	161,000	163,000	178,000	191,800	205,400	218,700	3.7	2.4	3.2	1.0	1.3
Trans., Comm., & Utilities 2/	61,300	72,200	91,400	113,000	146,100	150,900	160,400	170,000	180,100	192,000	2.0	2.1	2.6	0.9	1.1
Wholesale Trade	53,600	64,600	100,600	128,500	155,400	158,700	172,400	184,100	195,000	205,800	3.2	2.5	1.9	1.0	1.1
Retail Trade	126,500	176,300	280,800	392,900	494,300	517,000	550,000	580,800	611,000	644,700	4.1	3.4	2.3	1.1	1.0
Finance, Ins, Real Estate	38,300	58,400	91,800	115,500	137,300	147,300	157,100	167,900	177,800	181,800	4.5	2.3	1.7	1.4	0.9
Services	103,500	169,700	308,500	504,300	777,600	868,400	973,400	1,056,300	1,133,300	1,223,500	5.6	5.0	4.4	2.3	1.4
Traded Services 1/	17,200	38,500	83,500	146,300	277,100	312,900	368,100	409,200	447,500	494,200	8.2	5.8	6.6	2.9	1.9
State & Local Government	115,900	186,500	263,000	323,900	413,300	439,200	472,800	504,000	534,100	568,500	4.2	2.1	2.5	1.4	1.2
Federal Government	50,700	58,100	67,900	73,700	69,900	70,400	72,500	69,800	70,200	70,400	1.5	0.8	-0.5	0.4	-0.3
Goods-Producing	263,100	294,600	404,900	490,400	515,400	491,500	527,600	551,400	570,600	587,600	2.2	1.9	0.5	0.2	0.7
Service-Producing	549,800	785,900	1,204,100	1,652,000	2,193,800	2,351,900	2,558,500	2,732,800	2,901,500	3,086,700	4.0	3.2	2.9	1.5	1.2
Total Non-Agricultural Emp.	812,900	1,080,500	1,609,000	2,142,400	2,709,200	2,843,400	3,086,100	3,284,200	3,472,100	3,674,300	3.5	2.9	2.4	1.3	1.1

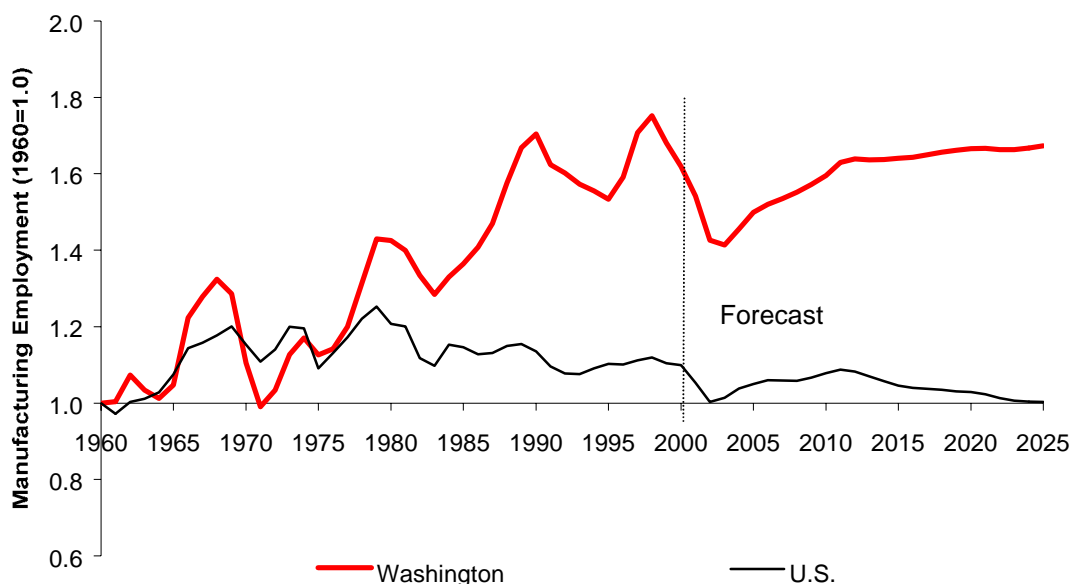
1/ Significant break in series after 1990 due to reclassification of a portion of chemicals (SIC 2819) to commercial physical research (SIC 8731).

2/ Significant break in series in 1996 due to reclassification of a portion of Engineering Services (SIC 8711) to Sanitary Services (SIC4959).

However, internal efficiencies and technological changes leading to productivity gains will serve to hold employment growth in check. Some of the gains in output per worker will be market driven, arising out of increased competition in a world economy. Others will be dictated by necessity – the need to adapt to a more slowly growing labor force and, in some cases, growing scarcity of raw materials. In either case, the drive for greater efficiencies will constrain overall employment increases in goods producing sectors (Figure 3-2). Thus, manufacturing employment in Washington is expected to increase only slightly over the next 25 years – 0.3 percent per year for 13,600 over the entire period. The national economy, in contrast, is expected to lose manufacturing jobs throughout the forecast period.

Washington is expected to share the national outlook for slower growth in population and employment in the future. But employment growth in the state manufacturing sector will, contrary to the projected negative growth for the U.S., stay in positive territory, owing to the concentration of capital equipment production in Washington's primary export base and to the state's accessibility to the rising Asian markets.

Figure 3-2
Manufacturing Employment Trends: Washington and U.S.



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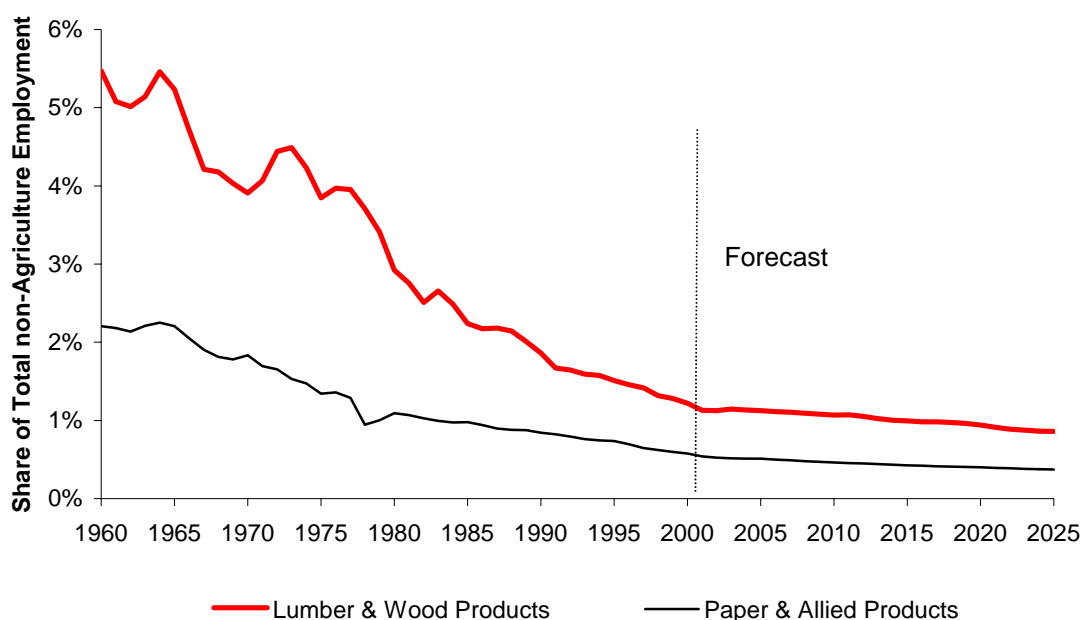
The need for major investments in plant and equipment, both domestically and in the developing nations, is destined to accelerate through the next decade. Accordingly, growth in machinery and electronics will set the tempo of Washington's manufacturing advance in both the short- and long-run. Aerospace employment had a down cycle beginning in the third quarter of 1998 and, after a pause in the first half of 2001, resumed job reductions. The current decline is expected to taper off by late 2002. Further downsizing in lumber and wood products, primary metals, food and kindred products, furniture and fixtures, and paper and allied products will be offset by positive job growth in the rest of manufacturing in the next two-and-a-half decades.

Lumber and Wood Products

Jobs in lumber and wood products are expected to decline slightly throughout most of the forecast period. This is basically a continuation of the long-term trend extending back to the end of World War II. In 1947, the lumber and wood products industry employed 58,800 workers, which accounted for 8.9 percent of all non-farm jobs and 34 percent of all manufacturing jobs in the state. In 2001, employment stood at 30,600 workers and the shares had fallen to 1.1 percent and 9.2 percent, respectively. By 2026, lumber employment is projected to total 31,500 workers, representing 0.8 percent of total non-agriculture jobs and 8.6 percent of manufacturing jobs in the state (Figure 3-3).

Figure 3-3

Share of Total Washington Non-Agricultural Employment: Lumber and Paper Industries



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The structure of the industry has changed dramatically in the post-war period. As with other goods-producing sectors, greater worker productivity has been a major factor behind a shrinking lumber and wood products employment base. Increased mechanization and newer logging and milling technology have decreased the number of workers needed for production.

Over the last decade a significant shift occurred on the supply side. In the late-1980s, policies corresponding to a heightened demand for environmental and wildlife protection effectively removed a sizable portion of the region's available stock of raw material from production. Federally owned forests, managed by the U.S. Forest Service and the Bureau of Land Management, were the focus of legal and regulatory efforts to comply with the Endangered Species Act. These measures were designed to protect the habitat of the Northern Spotted Owl, the Marbled Murrelet, and various species of salmon. Consequently, timber sales from the federal lands in the state have declined substantially, heightening the costs of raw material for local sawmills and planing mills.

It is expected that lumber and wood products employment will continue to be affected by environmental constraints throughout the forecast period. These pressures are likely to force accelerated investment in resource-saving (i.e., making more out of the same amount of raw material) and laborsaving technology. Higher material costs and competition from both Canadian lumber manufacturers and alternative building materials such as steel and composites will result in added emphasis on offsetting efforts to improve internal production efficiencies. These factors all point to a constrained demand for labor.

Paper and Allied Products

Employment in paper and allied products declined from 18,100 in 1990 to 14,600 in 2001, and is expected to dip slightly to 13,400 by 2026. In relative terms, the industry's employment share will drop from 0.5 percent of total non-agricultural wage and salary employment in 2001 to 0.4 percent in 2026. The industry is highly capital-intensive, and gains in productivity will enable output to climb while employment declines.

Many of the same forces affecting lumber and wood products apply to the pulp and paper industry. Environmental laws have affected processing requirements, and limits in harvesting have similarly affected supply. Indeed, these factors have contributed to several plant closures in the state during the past decade. To its advantage, the paper industry is somewhat more flexible than lumber in acquiring raw resources. Chips can be imported and recycled paper can be used. Many paper plants already process a significant amount of recycled materials.

A significant portion of the industry's production in Washington is exported. But rising competition from Asian and Canadian operators will provide a dampening effect on the future growth of this industry in the state. On the other hand, environmental demands may result in accelerated investment in resource-saving and pollution abatement technologies. Adoption of these technologies will enhance the industry's viability in the region.

Aerospace

Aerospace employment in Washington increased 42 percent from 79,800 in December 1995 to 113,400 in July 1998. However, by 2001 industry employment had fallen 23 percent to 87,000. Aerospace employment in the state is expected to further retrench over the forecast period as productivity gains and use of the production capacity in other states and nations more than offset output growth. Pressures are driving the emphasis on cost control within the industry, and on operating margins as Boeing competes head-on with Airbus Industries and other potential foreign producers.

Boeing had two major acquisitions in the 1990s. The first was the buyout of Rockwell International's aerospace and defense operations in 1996; and the second was a merger deal with McDonnell Douglas in 1997. Both significantly strengthen the company's defense and space businesses. In November 2000, Boeing created an Air Traffic Management Division, enacting on the company's diversifying strategy to enhance business viability and growth. In September 2001 the company moved its corporate headquarters to Chicago.

The prospect for long-term demand is bright. Boeing predicts that the world air traffic will grow 4.9 percent per year on average over the next two decades. A total of 22,300 new jets worth \$1.5 trillion is envisioned, requiring output of 1,115 planes a year by the world's commercial aircraft manufacturers. A third of the demand is expected to emanate from replacement aircraft because of fuel inefficiency, excessive noise, or obsolescence. The remaining two thirds will be generated by new growth in air travel, particularly in the Asia-Pacific Rim area. A disproportionate amount of revenues will come from Asian carriers because of their growing demand for the more expensive two-aisle, long haul aircraft. Two-thirds of all new aircraft deliveries are expected to go to carriers outside the U.S.

Prospects of aerospace employment in the state will be limited by several factors. One major factor is foreign competition, particularly from Airbus. In the medium to long-term, potential competition may come from Russia and Japan. And even some Pacific Rim nations have been developing manufacturing capabilities and may present competition to the local suppliers and subcontractors. The second factor is productivity. Facing the challenge of foreign competition, Boeing recognizes that productivity of its workers must continue to improve. Higher productivity means that job growth will be restrained. And, third, in order to gain new aircraft orders from foreign carriers, Boeing will likely continue to outsource certain components to manufacturers in the foreign carriers' home countries. Although the outsourcing practice appears to limit employment growth in Washington, it will also prevent the loss of market share (and jobs) to Airbus and other competitors.

Other Transportation Equipment

Other than aerospace, Washington's transportation equipment production consists of shipbuilding, boat building, and manufacturing of vehicles (primarily heavy trucks and trailers). Each segment of this industry faces very different market forces and prospects. Construction of the cross-Sound ferryboats in the past few years represented a major revenue source for the shipbuilding industry in the state. Repealing of the motor vehicle excise tax I-695 in 2001 threatens the shipyard jobs as it forces the state ferry system to curtail services and building of new vessels. Fortunately, spin-off from the Navy's Everett Homeport is generating substantial overhaul and maintenance work now for local shipyards.

Luxury yachts and other pleasure craft have seen healthy business growth in the past decade and can be expected to move in tandem with the general economy. In addition, sales of heavy trucks and trailers can be expected to increase over time with the growth in capital investment at home and abroad.

Primary Metals

Washington's primary metals industry is dominated by aluminum smelting and refining. The availability of cheap, abundant, and reliable electrical power that is essential in the electrolytic reduction process has long been a factor in siting aluminum plants in the region. Energy represents about 30 percent of aluminum production costs.

The region's aluminum producers enjoyed a distinct competitive advantage with respect to energy costs until a big electric rate increase in 1979. To remain competitive, the Bonneville

Power Administration (BPA) agreed to tie power rate changes to the prevailing world price of finished aluminum and to participate in new plant and equipment investments to enhance overall operating efficiencies. This largely restored the industry's competitive position during the subsequent periods of high demand.

Several unsettling factors affected the picture in the early 1990s. World production exceeded demand and sales were maintained only by international agreement to address weakened market conditions. Russia possesses a significant aluminum production capacity. The prices fell precipitously in 1992-93 as the very weak ruble and the deteriorated domestic demand caused Russia to flood the world market with cheap aluminum ingots. Demand strengthened in 1994-99 and some idled capacity was put back on line.

The price and availability of electricity will clearly play a significant role in determining the future of aluminum production in Washington. As the regional economy grows, aluminum producers will see more competition for electricity use from residential, commercial, and other manufacturing consumers. In an evolving regime of energy deregulation, the electricity rates in the state will approach parity with those elsewhere in the western states. The 2000-01 energy price hikes led to full or partial closings of all of Washington's smelters. How much of the closed production capacity will be brought back on line will depend upon a resolution to the energy situation and aluminum prices in the international market.

Actually, the increased competition for electricity has already been realized. In late 1993, the BPA reduced by a quarter the amount of power available to aluminum producers and raised the price of electricity by 20 to 25 percent. In 1996, aluminum producers in the region negotiated a new contract with the BPA. The new agreement requires, for the next five years, that aluminum companies buy the BPA's electricity at fixed rates, but at the same time it allows the companies to purchase electricity from other suppliers.

Over the past decade-and-a-half the industry has made significant strides in increasing efficiencies and enhancing competitiveness. Demand for primary and fabricated metal should remain strong throughout the forecast period, given the bullish outlook for both consumer and industrial durable goods. But under the pressure of growing foreign competition and rising input costs, employment in the state is expected to decline in the future.

Machinery and Instruments

Growth of Washington's machinery and instruments sector has been strong over the past 20 years, and will continue to show strength for the foreseeable future. Combined employment in electrical and non-electrical machinery and instruments manufacturing in the state has risen at a robust 5 percent average annual pace since 1970 – almost twice the pace of total employment growth. Of particular note has been the explosive growth in electronics, and scientific and medical instruments.

In 2001, machinery and instruments industries in Washington employed 60,000 workers, accounting for 17.1 percent of total manufacturing jobs in the states. The forecast predicts a 35

percent employment increase in these sectors between 2001 and 2026. By 2026, about 22 percent of the state manufacturing jobs will be in these industries.

Market adjustments in the semiconductor industry have brought about several restructurings in the past decade. But the demand for computer hardware is expected to remain strong throughout the forecast period: the need of businesses to increase productivity requires the application of computer technology and electronic devices as an integral part of the daily work environment; and the use of computers in schools and homes has also become commonplace.

The state's prospect for attracting and retaining high-technology manufacturing are likely to remain positive given the thrust of state and local economic development efforts. Cases in point include the Intel research and development facility at DuPont, and the WaferTek plant at Camas, which opened in 1997.

Non-electrical machinery production is keyed largely to farm, construction, forest products, and other heavy industries. The outlook for this sector is bright, although below that of the electronics industry. Overall investment levels are expected to continue strong. At the same time, new and expanding markets in Europe, Asia, and Central and South America are strong possibilities in the long run given the accelerating trend toward greater industrialization in these economies.

Food Processing

The diversity of Washington's farm production is expected to continue. Major products in the state include frozen potatoes, apple juice, and processed seafood. In addition, roast coffee and coffee products are a growing segment. Increasing uses of mechanization, biotechnology, online telecommunication, global positioning systems, and remote sensing will characterize the changes in the industry's production and distribution processes over the long run. But in contrast to sharp declines projected nationally to 2026, employment in Washington's food processing sector is expected to remain flat as the markets for the industry's products continue to expand, both domestically and overseas.

Crop production will drive the industry due to the importance of the state's fruit and vegetable harvests. Long-term prospects for processed fruits, vegetables, and specialty products look very strong. Some labor market and demographic trends favorable to raising the demand for convenience foods include: a growing number of households having two or more workers; and elderly population (age 65 years and older) increasing at a rate more than twice that of the total population.

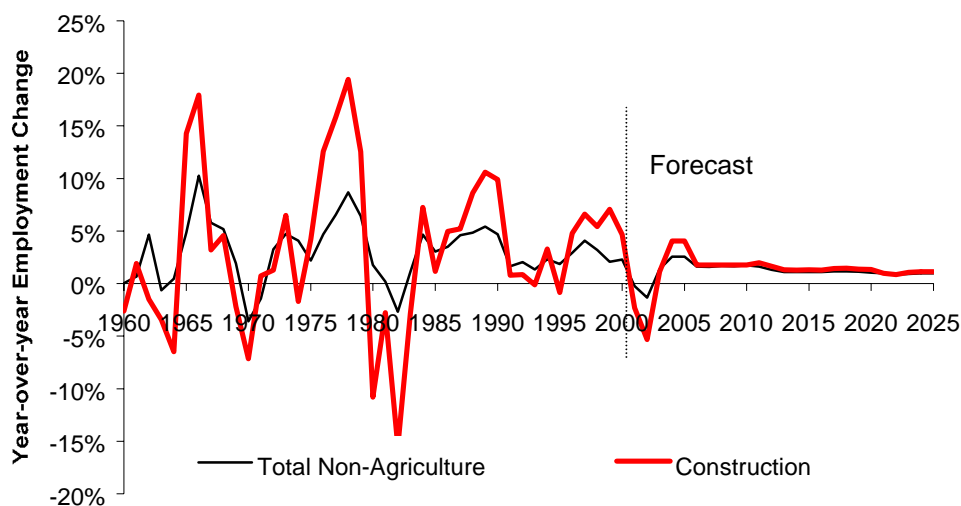
Foreign exports are assumed to constitute ever-larger proportions of total sales over the long run. This is expected for both fresh and processed products. Niche markets will play increasingly important roles, aided by the growing popularity of western style foods in the developing countries. The opening of economies in Asia to free trade will add additional opportunities to expand export markets.

Construction

Historically, construction activity in the state has been very volatile. Short-term demand is sensitive to interest rates and the business cycle. In addition, large public works projects can exert a powerful short-term influence. In the long-term, however, the demand is primarily determined by construction costs, demographic changes, and employment growth. Population growth mainly affects the need for residential housing, whereas employment growth determines commercial buildings and non-building construction.

In spite of its many short-term ups and downs, the long-term average level of construction employment relative to total employment has actually been quite stable. Over the past 30 years, construction employment has been about 5.2 percent of total non-agricultural employment, with fluctuations occurring around this level during boom and bust periods. The lowest ratio of construction employment to total employment during the past 30 years was 4.7 percent, occurring on several occasions during economic slowdowns. The highest level of this ratio was 6.6 percent in 1979, when an economic boom was underway and the Washington Public Power Supply System had five nuclear power plants under construction. As of 2001, construction industry accounted for 5.8 percent of total non-farm employment, averaging 157,300 jobs. Construction activity in the 1980s was brisk, spurred by a surging investment in commercial projects (i.e., office, industrial, and retail space) and the booming housing market in the second half of the decade. As a result, average growth in Washington construction employment increased to 2.4 percent per year over the decade. Construction employment again rose at a 3.3 percent annual rate between 1990 and 2001, especially since 1995 when rising personal income and low interest rates stimulated housing activities.

Figure 3-4
Relative Growth in Construction and Total Non-Agricultural Employment



However, the high rate of growth in the 1990s will not sustain in the long run. Throughout the forecast period population growth is predicted to gradually slow down. Likewise, the growth rate of total employment is forecast to fall gradually. These two factors suggest that both the residential and non-residential demand for construction employment also will increase at a slow rate over the forecast horizon. Some of the decline will be offset by rising incomes and the subsequent demand for more expensive housing and for remodeling/replacement. In addition, the prospects of low, stable long-term interest rates and inflation in the future would contribute to raising the levels of investment in residential and commercial buildings.

The future of the construction industry will be influenced by technology changes: telecommunication, teleconferencing, home and mobile offices, telecommuting, Internet shopping, and inventory management. These factors will exert significant influence on both the quantity and the types of building space demanded.

Taking into account all the positive and negative factors affecting the industry's future, the forecast suggests that construction employment will retain its share of overall employment. Construction employment as a share of total non-agricultural wage and salary employment will stay in the 5.5-6.0 percent range.

Service-Producing Employment

The relationship between goods-producing industries and service producing sectors has changed substantially over the past 30 years. Increased productivity has slowed the pace of job growth in the goods producing sectors, while heightened demand has accelerated job growth in consumer and business services, retail trade, and other non-manufacturing sectors. Also of note is that, during the past 15 years, there has been tremendous growth in professional and high-tech services employment in the state.

In 1960, non-goods producing jobs represented about two-thirds of total non-agricultural wage and salary employment. By 2001, the share had risen over 80 percent. It is expected to rise further in the forecast to more than 84 percent by 2026 (Table 3-3).

Transportation, Communication, and Utilities (T.C.U.)

Over the past 30 years, the share of total non-agricultural employment represented by T.C.U. has steadily declined from 6.7 percent in 1970 to 5.4 percent in 2001. Much of this is due to technological advances in industries such as trucking, shipping, air transportation, and telecommunications. These advances have greatly increased capital intensity and labor productivity in these industries, resulting in large gains in output possible with a less corresponding increase in employment.

Telecommunication is the industry where most new products/services will be seen in the next decade. This occurs mainly as a result of the integration of voice, data, and video services through wire line (coaxial or fiber optic cable) or wireless (radio systems, microwave, or satellites) networks. Almost every aspect of telecommunication services (including local

exchange, cellular and Internet telephony, broadband networks, and global information flows) will undergo paradigm shifts. In addition, the U.S. Telecommunication Act of 1996 has just started showing its effect on removing barriers to local competition.

However, in the past few years the industry has spent heavily on building and expanding infrastructure. The “race” to be the first and fastest to build infrastructure in the absence of revenue generation and profitability has led to gross over-capacity, investor burnout, bankruptcies, and industry restructuring. It may take some time for the current unused capacity to be absorbed and then for the industry investment to revive.

The deregulation of most T.C.U. industries has resulted in higher operating efficiency and productivity gains. The forecast calls for the benefits of deregulation and further technological improvements, especially in communications, to sustain the demand for T.C.U. services and thus for the industry employment to increase at a healthy pace. T.C.U. jobs as a share of total non-agricultural employment is expected to stay around 5.2 percent over the forecast period.

Wholesale Trade

Although the function of the wholesale trade sector is selling merchandise to retailers (or other wholesalers), wholesale trade employment has grown at a substantially slower rate than retail trade employment over the past 30 years. This reflects the adoption of productivity-enhancing technologies and improvements in business practices such as computerization, sophisticated inventory controls, and more efficient systems of distribution and delivery. Productivity and management improvements are expected to continue. Vertical integration in the past decade, as evidenced by the evolving warehouse/discount retailing, one-stop shopping, and specialty superstores has chipped away some employment growth in wholesale industry.

In 2001, wholesale trade employment in the state reached 156,300. It is predicted that the industry employment will grow at an average annual rate of 1.1 percent over the two-and-a-half decades after 2001 (Figure 3-5).

Retail Trade

Retail trade has increased its share of the state total employment over the past 30 years, primarily reflecting increases in income and spending power. During the 1960s and 1970s, growth of household income came from increases in wages and rising female labor participation. In the 1980s, little or no growth of real wages occurred, but spending power still increased as a result

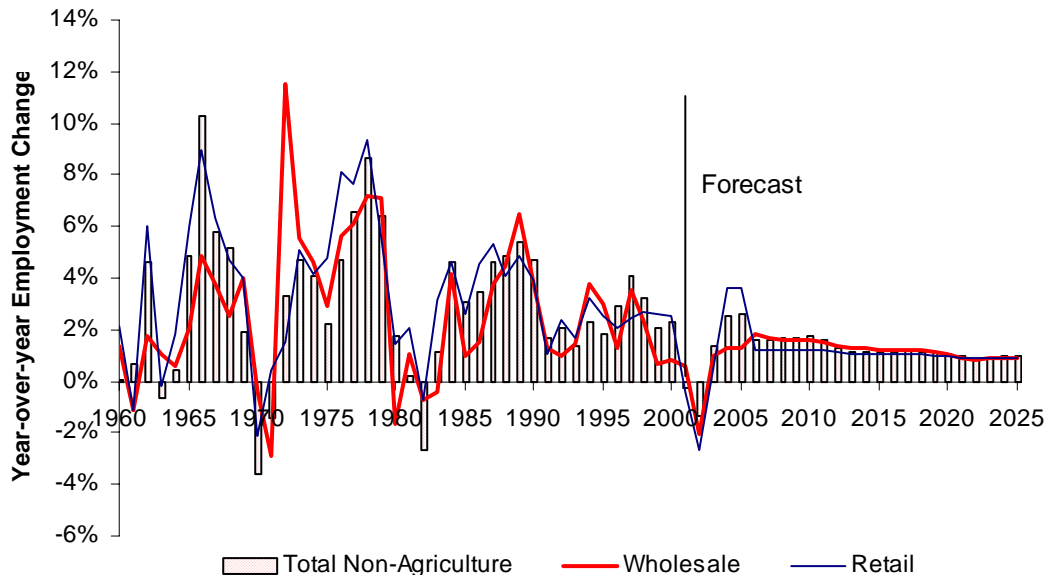
Table 3-3
Percent Share of Total Non-Agricultural Wage and Salary Employment by Industry

	Actual				Forecast					
	1960	1970	1980	1990	2000	2005	2010	2015	2020	2026
Manufacturing 1/	26.7%	22.2%	19.2%	17.2%	12.9%	11.4%	11.2%	10.8%	10.4%	9.9%
Non-durable Manufacturing	8.7	6.9	5.4	5.1	4.0	3.7	3.5	3.3	3.2	3.1
Foods & Kindred Products	3.3	2.7	2.0	1.8	1.5	1.5	1.4	1.3	1.2	1.1
Apparel Products	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2
Paper & Allied Products	2.2	1.8	1.1	0.8	0.6	0.5	0.5	0.4	0.4	0.4
Printing & Publishing	1.1	1.0	1.0	1.1	0.9	0.9	0.8	0.8	0.8	0.8
Chemical & Products 1/	1.3	0.5	0.5	0.6	0.2	0.2	0.2	0.2	0.2	0.2
Misc. Non-durables	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4
Durable Manufacturing	17.9	15.3	13.7	12.2	9.0	7.7	7.7	7.5	7.2	6.9
Lumber & Wood Products	5.5	3.9	2.9	1.9	1.2	1.1	1.1	1.0	0.9	0.9
Furniture & Fixtures	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Clay, Glass, Stone Products	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2
Primary Metals	1.3	1.3	1.0	0.6	0.4	0.3	0.3	0.2	0.2	0.2
Fabricated Metal Products	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5
Non-Electrical Machinery	0.7	0.9	0.9	1.0	0.9	0.9	1.0	0.9	0.9	0.8
Electrical Machinery	0.3	0.4	0.7	0.5	0.7	0.7	0.7	0.7	0.7	0.8
Aircraft & Parts	7.1	5.7	4.9	5.4	3.2	2.4	2.4	2.4	2.2	2.0
Other Trans. Equipment	1.0	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.4	0.4
Instruments	---	---	---	0.7	0.5	0.6	0.6	0.6	0.6	0.6
Miscellaneous Mfg.	---	---	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
Mining	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Construction	5.5	4.9	5.8	5.5	5.9	5.7	5.8	5.8	5.9	6.0
Trans., Comm., & Utilities 2/	7.5	6.7	5.7	5.3	5.4	5.3	5.2	5.2	5.2	5.2
Wholesale Trade	6.6	6.0	6.3	6.0	5.7	5.6	5.6	5.6	5.6	5.6
Retail Trade	15.6	16.3	17.5	18.3	18.2	18.2	17.8	17.7	17.6	17.5
Finance, Ins, Real Estate	4.7	5.4	5.7	5.4	5.1	5.2	5.1	5.1	5.1	4.9
Services	12.7	15.7	19.2	23.5	28.7	30.5	31.5	32.2	32.6	33.3
Traded Services 1/	2.1	3.6	5.2	6.8	10.2	11.0	11.9	12.5	12.9	13.5
State & Local Government	14.3	17.3	16.3	15.1	15.3	15.4	15.3	15.3	15.4	15.5
Federal Government	6.2	5.4	4.2	3.4	2.6	2.5	2.3	2.1	2.0	1.9
Goods-Producing	32.4	27.3	25.2	22.9	19.0	17.3	17.1	16.8	16.4	16.0
Service-Producing	67.6	72.7	74.8	77.1	81.0	82.7	82.9	83.2	83.6	84.0
Total Non-Agricultural Emp.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1/ Significant break in series after 1990 due to reclassification of a portion of chemicals (SIC 2819) to commercial physical research (SIC 8731).

2/ Significant break in series in 1996 due to reclassification of a portion of Engineering Services (SIC 8711) to Sanitary Services (SIC4959).

Figure 3-5
Relative Growth in Trade and Total Non-Agricultural Employment



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of continued growth in the labor earnings of women. In addition to providing higher household income, increases in the number of two-income households also reduced the time available for preparation of meals at home, further fueling growth of eating and drinking establishments, the largest and fastest growing retail trade sector.

Factors affecting the retail employment forecast include the expectations that future wage increases will not match those of the 1960s and 1970s, and increases in total personal income will be slower in the next 25 years than was the case between 1970 and 2001 (see Chapter 4). In addition, since there are now already many women in the labor force, future growth of two-income households is expected to slow down.

Other trends in retail trade will also act to reduce employment growth in that sector. Increasing worker productivity and economies of scale, generated by warehouse-type superstores, will continue to offset employment growth to some extent. Another uncertainty with respect to future retail employment growth is the evolution of electronic shopping through the Internet. The effect of e-tailing is double-edged: it brings to Washington retailers, big or small, relatively easy access to national and even international markets; but at the same time it subjects local retailers to more competition from out-of-state retail operations. General merchandise retailers will be more affected by this evolution of e-tailing than those emphasizing specialty goods and services.

Taking into account the factors discussed above, the forecast calls for retail trade employment to continue to rise, but at a slower rate than in the past. Consequently, retail trade's share of total wage and salary employment over the forecast years will remain in the 17.5-18.0 percent range.

Finance, Insurance, and Real Estate (F.I.R.E.)

Historically, employment in F.I.R.E. has grown slightly faster than total wage and salary employment, reflecting the growing population and rising real personal income. In the late 1980s and most of the 1990s, this trend was reversed due to the slowing population growth, overbuilding of commercial real estate, productivity improvements, mergers, and a shift toward electronic banking. Offsetting these negative factors were the inter-temporal booms in mortgage financing/refinancing and the expanding services that financial institutions provide. The low and stable interests, accompanied by the prospering security markets, stimulated the growth in investment banking and brokerage businesses.

In the late 1990s, vigorous income growth and low mortgage interest rates gave rise to real estate financing activities. It also appeared that retrenchments and consolidations of the financial industry had quieted down. As a result, employment in F.I.R.E. increased steadily.

In the next two decades, aging of the population will raise the demand for F.I.R.E. services. This happens as the baby boom generation moves into the age cohorts that save a high proportion of their income, and as the elderly population with high assets ownership grow.

After 2001, employment in F.I.R.E. will increase at a slower rate than in the past.

Computerization and other advances will increase growth in output per worker in F.I.R.E. and these productivity increases will to some extent offset the increasing demand for F.I.R.E. services, which result from higher incomes, demographic changes, and the expanding banking, finance, and insurance services/products. Trends toward electronic banking, interstate banking, and the proliferation of smaller community banks are uncertainty factors affecting employment growth in this sector.

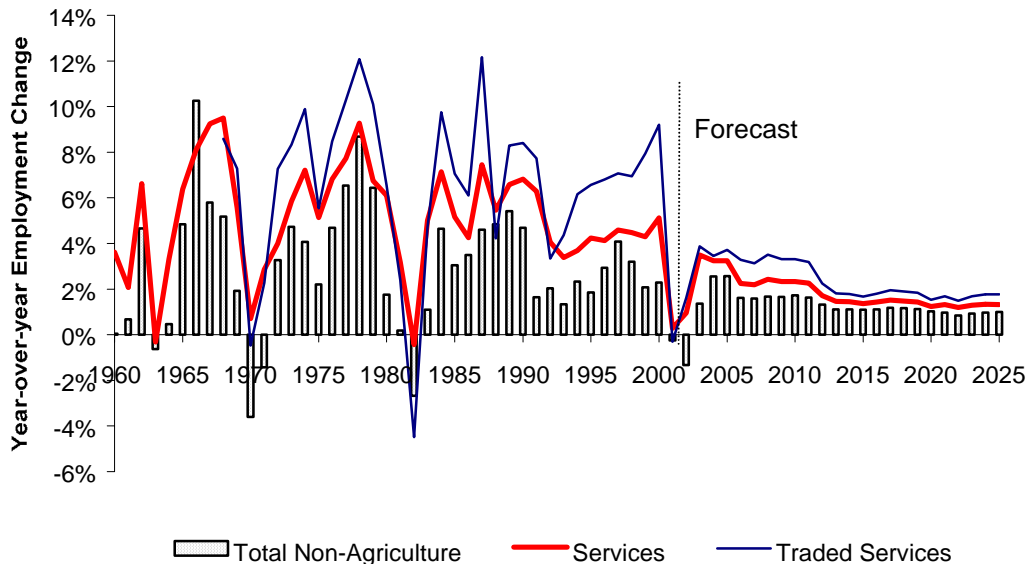
Services

Services have been the fastest growing industry division of the economy in recent years, and this is expected to continue during the forecast period. Services employment grew an average 5.2 percent per year in the past 30 years. In the future, services employment growth is expected to slow significantly to an annual rate of 2.3 percent from 2001 to 2010, and further slow to 1.4 percent per year through 2026 (Figure 3-6). However, services employment still remains the fastest growing sector throughout the forecast period. Its share of total wage and salary employment will grow from 28.9 percent in 2001 to 33.3 percent in 2026.

Traded services, including legal services, business services, engineering, management, and accounting services, represent more than one-third of total services employment. This group has been growing faster than the rest of the services division, and is predicted to lead this division in the future. By 2026, the traded services will have grown to 40 percent of all services employment. Growth in the traded services can be attributed to numerous factors. Much of this growth reflects the trend by businesses to contract out certain practices. The ever-increasing complexity of the legal, human resource, marketing, information technology, and e-commerce fields has resulted in more and more firms out-sourcing these functions.

Another factor in the growth of business services has been the increasing use of temporary personnel to perform specialized tasks or to meet peak periods of demand. As a result, there has been rapid growth in employment at temporary help and employment agencies.

Figure 3-6
Employment Growth: Total Non-Agriculture, Services, and Traded Services



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The growth of prepackaged software industry in the state has been phenomenal. A Washington company, Microsoft Corporation, is the largest firm in this industry. An impact study by Conway and Associates indicates that Microsoft was the state's seventh largest employer in 1995. According to the report, each of the almost 9,000 Microsoft jobs leads to 3.4 other jobs in the state. Including stock options, the average employee at Microsoft earned more than \$138,000 in 1995. The company has been growing briskly, both domestically and in foreign markets. Although the same pace of growth will not last indefinitely, the company does plan to add as many qualified employees as they can find in the next few years. The rapid growth of high-wage jobs at Microsoft and other software development companies around the state has contributed to the growth as well as diversify of the state economy.

Although other services are not expected to grow as fast as traded services, they will continue to grow significantly faster than total wage and salary employment. Health services employment has experienced fast growth in the past; future growth, however, is expected to be only slightly above average. Historical increases in health services jobs reflect an increasing commitment of society's resources to health care. Future increases in the proportion of national income spent on health care depend on such factors as aging of the population, cost pressures, and development of advanced treatment procedures and new drugs.

Personal and repair services will probably be the weakest of the service subsectors, while hotels, amusement and recreation, education, and social services will be relatively strong.

State and Local Government

Education is a major function of state and local government. State and local government employment grew faster than total employment between 1958 and 1972, as the Baby Boom generation moved through the educational system. Growth in the primary school age (i.e., age 5-17) population began to slow down in the second half of the 1990s. However, the slowdown in the primary school age population comes at a time when growth in the college-age population (age 17 to 22) will be increasing. The increase in the college-age population will lead to adding employment in higher education. This trend is enhanced by the evolving New Economy, whose information-intensive and productivity-driven growth demands workers with post-secondary education.

Several factors are working together to slow down the growth of government employment. The first is passage of Initiative 601 in 1993, which limits growth by tying spending to the growth of total population and inflation. The second is a general sentiment across the nation that government has grown too large to be effectively managed, and thus the increasing practices of outsourcing government functions to private providers. Most of the growth in the combined “state and local government” sector is expected to occur in local government employment.

Overall, the proportion of total wage and salary employment represented by state and local government is expected to remain flat over the next 25 years, despite the projected increases in the demand for services provided by the public sector.

Federal Government

Federal government employment has declined as a percentage of total employment throughout the post-World War II era. This trend is expected to continue; although some areas of federal government activity, such as the postal service and park service, are expected to increase along with the population. In the past few years, base closures in other states transferred military personnel to Washington; these shifts helped but were not enough to offset declines in other areas of federal civilian employment. In the future, federal government employment level in the state is expected to remain essentially unchanged.

Employment Diversity

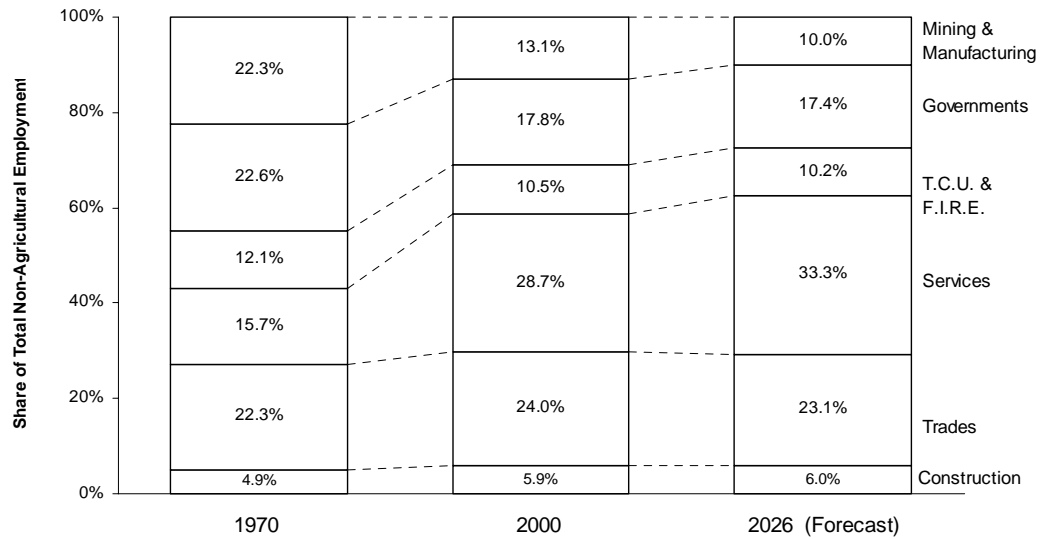
In 1960, manufacturing and government accounted for almost half of Washington’s wage and salary employment. Manufacturing employment at that time was dominated by aerospace employment and lumber and wood products employment. These two manufacturing industries accounted for almost half of manufacturing employment and close to 13 percent of total wage and salary employment. Government, excluding the armed forces, employed more than 20 percent of total wage and salary workers in the state. A third of government employment in 1960 was federal civilian workers, basically reflecting the strength and size of national defense-related establishments in Washington at that time.

For decades, the overall state economy moved in concert with the changes in its military, aerospace, and timber industries. Booms and busts in these industries frequently would induce the same condition in the overall state economy. However, this relationship has changed substantially. Government employment receded to about 18 percent of total wage and salary employment in 2001. This mainly reflects shrinkage in federal government employment, particularly in defense. Aerospace and timber industries now account for less than 5 percent of the state's non-farm employment. Manufacturing and government employment constituted less than one-third of non-agricultural employment in 2001, compared to about one-half in 1960.

Manufacturing employment in the state is projected to grow significantly slower than total employment in the next 25 years. As a result, the manufacturing share of total non-agricultural employment is expected to decline from 12.9 percent in 2001 to 9.9 percent by 2026 (Figure 3-7). The forecast calls for a reduction in the employment share of lumber and wood products industry from 1.2 percent in 2001 to 0.9 percent in 2026. Also, the aerospace industry's share of total state employment is projected to decline from 3.2 percent in 2001 to 2.0 percent by 2026.

The fastest growing industry division of the Washington economy has been services. This reflects to a large degree the shift in consumption from goods to services that has taken place nationwide. However, the fastest growing services are business services and engineering, management and accounting services, both are components of traded services. The services division is expected to continue to gain employment share throughout the forecast period. By 2026, services will constitute about one-third of total wage and salary employment. That means services employment will be larger than manufacturing and government employment combined by the end of the forecast period.

Figure 3-7
Distribution of Washington Employment by Industry



T.C.U. = Transportation, Communication, and Utilities. F.I.R.E. = Finance, Insurance, and Real Estate.

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CHAPTER 4

Long-Term Forecast of Washington Personal Income

TRENDS IN WASHINGTON PERSONAL INCOME reflect the pace of the state's economic and population growth. For private businesses, the size and composition of personal income provide a good measure of markets and consumer demand. For governments, personal income is an important parameter in monitoring state economic conditions, anticipating tax revenues, and assessing the level of services required.

Per capita personal income is often used as an indicator of economic well being of the state residents. Trends in state per capita income reflect local economic growth, population characteristics, poverty status, business climate, standard of living, and the state's obligation and ability to provide adequate public services (i.e., the means-tested entitlement programs).

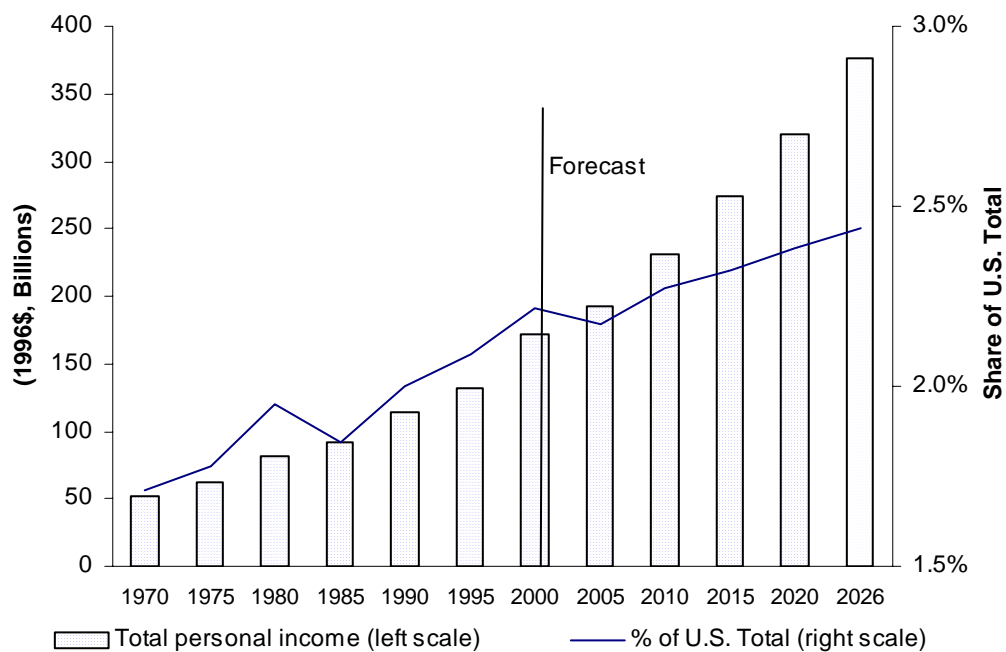
Total Personal Income Trends

In 2001, total personal income in Washington was \$188.9 billion. After adjusting for inflation, total state personal income in 2001 was more than three times its 1970 level, with an average annual growth rate of 4.0 percent over the past three decades. Total personal income in the state, inflation-adjusted, is projected to grow an average 3.2 percent a year between 2001 and 2026. This future growth represents a significant slowdown from the level that the state experienced in the past. The predicted slowdown in income growth reflects the expected lower increases in the state population and real per capita income. The latter factor roughly reflects the projected slowdown in labor force growth that will be only partially offset by the expected productivity increase.

Washington State in 2001 accounted for 2.2 percent of total personal income in the nation, a significant increase from the 1.7 percent share in 1970. The increased share reflects the fact that the state economy and population have been expanding faster than the nation as a whole. Economic and population growth in the state is expected to be more synchronized with the nation in the future and, by 2026, about 2.4 percent of the nation's total personal income is forecasted to be in the state (Figure 4-1).

Personal income growth fluctuates with business cycles. Long-term personal income growth in Washington closely mirrors the national trend, but with more erratic and volatile short-term movements (Figure 4-2). However, volatility in state personal income trends seems to have abated since the mid-1980s. The trend toward more stable income growth is attributable to the declining role of cyclical industries and the growing diversification of the Washington economy.

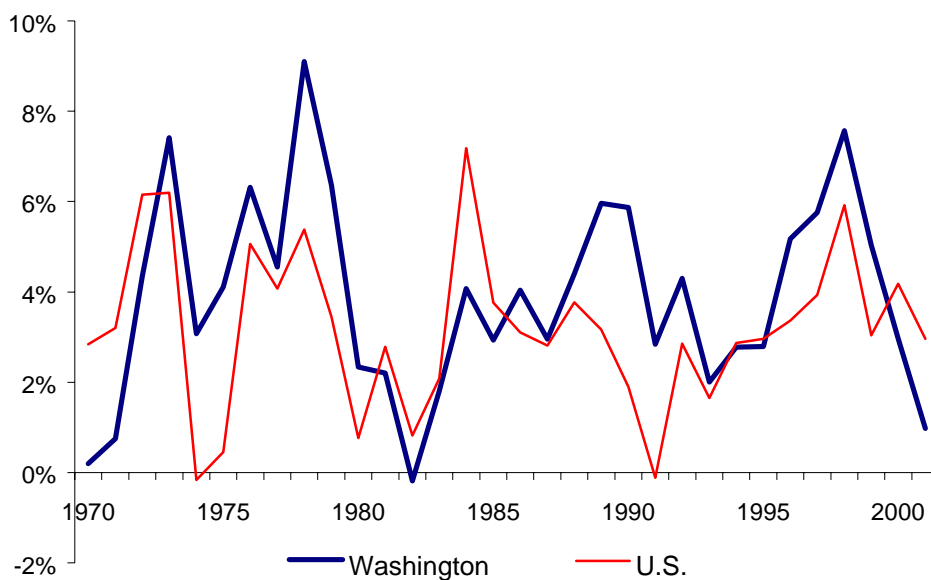
Figure 4-1
Total Personal Income: Washington, 1970-2026



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Figure 4-2
Annual Change in Total Real Personal Income



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Income Growth by Component

Personal income, as defined by the Bureau of Economic Analysis, has three major components: (1) earnings (wages, other labor income, and proprietor's income); (2) dividends, interest, and rent; and (3) government transfer payments. In 2001, earnings accounted for 73 percent of total personal income in Washington; and dividends/interest/rent and transfer payments represented 18 and 12 percent of total personal income, respectively. These three income components have been growing at varying rates over the past three decades (Table 4-1).

- **Earnings.** Washington real total earnings (in 1996 constant dollars) tripled from 40.0 billion in 1970 to 125.6 billion in 2001. The average annual growth rate of earnings was 3.8 percent, lower than the 4.1 percent rate for total personal income growth. Earnings growth is, understandably, subject to cyclical factors. The annual rate of real earning growth in the state has dipped to as low as -3.2 percent during the 1969-70 period, and has risen to a high of 9.9 percent in 1977-78.

In the first half of the 1990s, growth in total earnings in Washington significantly slowed. The 1.8 percent annual increase in 1993-95 was the lowest earnings growth the state has experienced since the 1982-83 recession period; cutbacks in the aerospace industry were the major culprit for the mediocre performance. The earnings growth then rebounded strongly to 6.8 percent per year in the 1995-99 period, but then slowed to 2.8 percent in 2000. In 2001, the estimated total earnings declined 0.1 percent from the previous year as the recession hit.

Table 4-1
Real Income Growth by Component: Washington

Income Components	Average Annual Growth Rate (%)						1970-2001
	1970-75	1975-80	1980-85	1985-90	1990-95	1995-01	
Total Personal Income	3.9	5.7	2.2	4.6	2.9	4.6	4.0
Earnings	3.4	5.5	0.9	4.9	2.8	4.9	3.8
Dividends, Interest, and Rent	3.6	9.1	6.1	4.6	1.8	3.7	4.7
Transfer Payments	8.1	3.3	4.8	3.8	5.9	3.0	4.7

Earnings growth has also varied significantly among industries (Table 4-2). Farm income in real terms has been flat since 1970, and its share of total earnings in the state declined from 3.2 percent in 1970 to 1.1 percent in 2001. Real earnings from manufacturing increased 94 percent, but its share of total earnings declined slightly from 23 percent in 1970 to 20 percent in 1990, and to 14 percent in 2001.

Despite substantial job gains, retail and wholesale trade has shown only modest growth in earnings. Actually, retail and wholesale trade earnings as a share of total earnings declined from 17 percent in 1970 to 15 percent in 2001 – a result of these sectors' low wages and slow wage growth. Real earnings from the services industry increased six fold over the 1970-2001 period, increasing at an annual rate of 6.6 percent – far above the 3.8 percent growth

rate for total earnings. Services cover a wide range of sectors and occupations. Earnings in services started accelerating in the second half of the 1980s, as more growth took place in the high-paying sectors of this industry such as business, health, and management and consulting services. In the second half of the 1990s, the strong economy, accompanied with a soaring equity market, raised the earnings growth to a 9.9 percent annual rate.

Since earnings are such a large proportion of total personal income, a special section at the end of this chapter is devoted to analyzing the sources of changes in average earnings over the past two decades.

Table 4-2
Growth in Real Earnings by Industry: Washington

	Average Annual Growth Rate (%)						1970-2000
	1970-75	1975-80	1980-85	1985-90	1990-95	1995-00	
Total Earnings	3.4	5.5	0.9	4.9	2.8	5.6	3.8
Farm	13.4	-7.9	-8.2	3.6	0.6	0.4	0.0
Manufacturing	1.7	6.9	-1.1	4.5	-1.1	2.6	2.2
T.C.U.	2.8	5.4	0.8	3.6	4.7	5.4	3.8
Wholesale & Retail	3.7	4.6	1.2	3.5	2.7	4.9	3.4
F.I.R.E.	1.2	8.5	0.5	6.9	5.4	7.0	4.9
Services	4.5	8.1	3.9	7.8	5.6	9.9	6.6

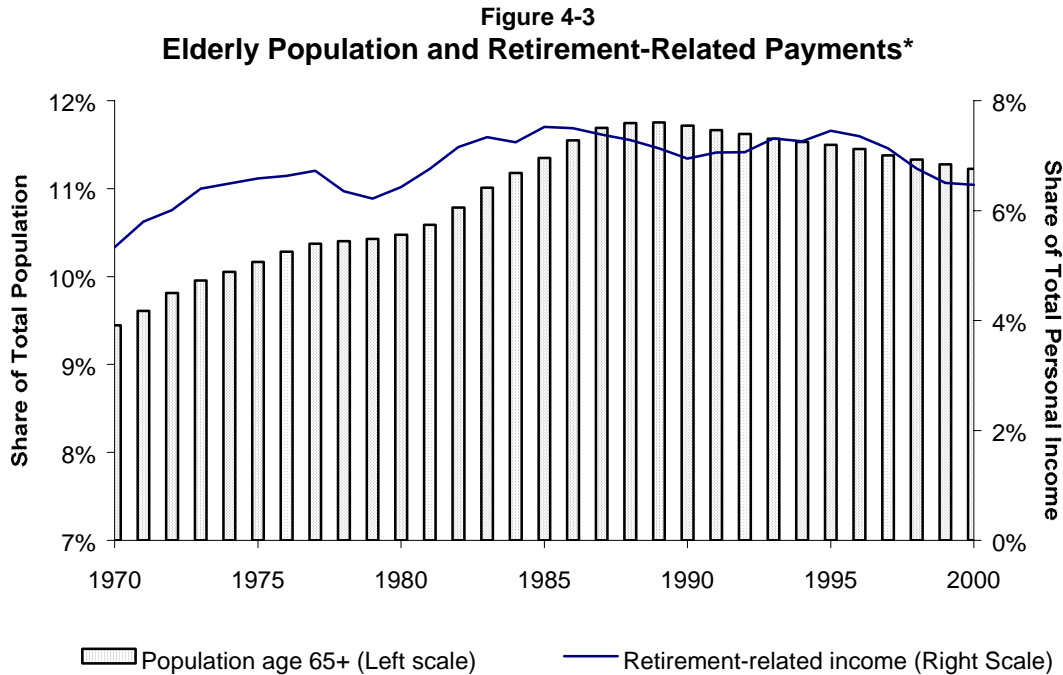
T.C.U.=Transportation, Communication, and Utilities. F.I.R.E.=Finance, Insurance & Real Estate.

- **Dividends, interest, and rent.** The proportion of total personal income derived from property- and saving-related income sources increased steadily from 14.3 percent in 1970 to 17.9 percent in 2001. The share of income from these sources increased in the 1980s due in part to high interest rates early in the decade, and soaring property value in the second half of the decade. Between 1990 and 1995, real income from dividends, interest, and rent grew at an annual rate of 1.8 percent in the state, far lower than the long-term average of 4.7 percent. From 1995 to 2001, this component of personal income rebounded to an annual growth rate of 3.7 percent, due mainly to the rising real estate property value/rent in the state.

In the short term, income from dividends, interest, and rent is affected mainly by the monetary policies and cyclical factors. Over the long run, it reflects past earnings and savings behavior. The future growth of this component of personal income thus depends on the state's ability to retain and attract families with the ability and propensity to save and invest.

- **Transfer payments.** The importance of transfer payments as a source of personal income has increased in the past three decades. In Washington, total transfer payments in real terms increased at an annual rate of 4.7 percent. Transfer payments as a share of total personal income increased from 9.9 percent in 1970 to 13.6 percent in 1995, and then declined to 12.4 percent in 2001. The growth of transfer payments reflects the impact of the government policies dealing with social security, welfare, and unemployment.

In 2000, about 55 percent of total transfer payments in the state were retirement and disability insurance benefits and Medicare payments. The level of transfer payments is affected by the state's demographic profile and relevant state and federal regulations (Figure 4-3). Aging of the population in the next few decades should contribute to the growth of this component of personal income.



* Includes government retirement and disability insurance benefit payments, and Medicare payments to individuals.

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A significant portion of transfer payments is counter-cyclical in nature. In Washington, income derived from income maintenance and unemployment insurance benefit payments accounted for as high as 28.1 percent of total transfer payments during the cyclical trough in 1971, and as low as 12.9 percent in 1990 when the state economy peaked in the business cycle. In the 1990s, the share rose to 17.6 percent in 1993, then declined steadily to 12.4 percent in 2000, which was the last cyclical peak of the state economy.

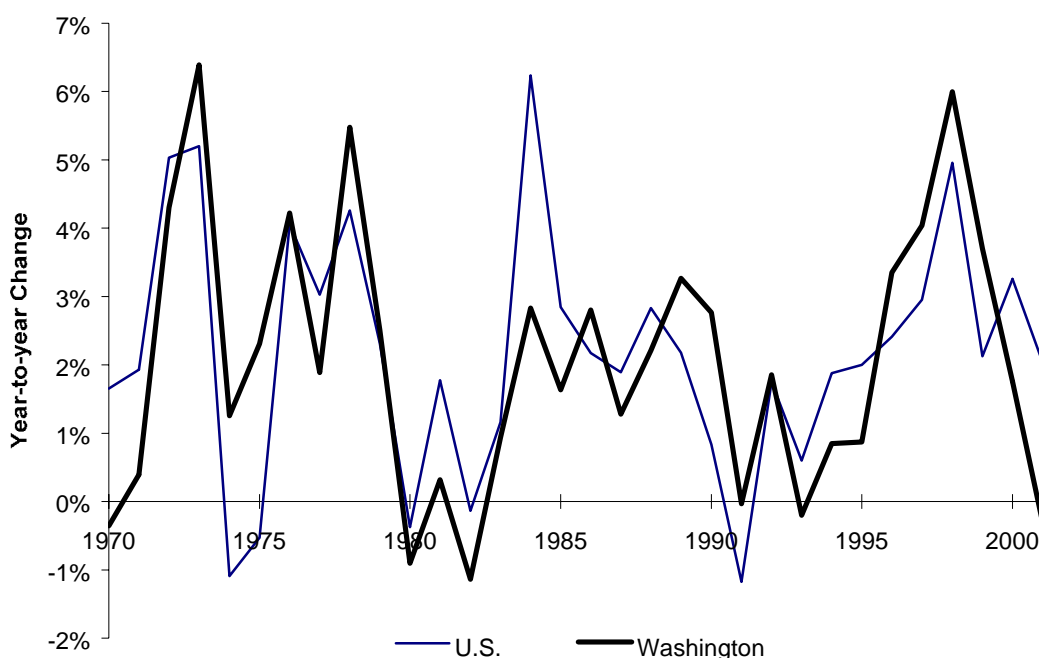
Per Capita Income Trends

Real per capita income is derived by dividing total state personal income by total population in the state, then adjusting for inflation using the Implicit Price Deflator (IPD) for personal consumption from the National Income and Product Account (1996 = 1.0).

In 2001, real per capita personal income for the state was estimated at \$31,484, which was about the same as the U.S. average of \$31,363. The state real per capita income in 2001 nearly doubled its level in 1970.

Between 1970 and 2001, Washington State real per capita personal income grew at an average annual rate of 2.1 percent. The growth did not follow a smooth path, but fluctuated along with the prevailing state economic conditions. During most of the expansionary periods, state per capita personal income rose faster than the U.S. average. Conversely, per capita income growth in the state usually plummeted below the national trend during recessions or periods of slow economic growth (Figure 4-4).

Figure 4-4
Annual Changes in Real Per Capita Income



In the past, growth in the state's aerospace industry, along with the industry's high wages and salaries, played a major role in the growth of Washington personal income. This was evident during the 1965-70 period when real per capita income in the state increased nearly 4.5 percent per year. On the other hand, the 1980-82 national recessions were particularly hard on the Washington economy. The state economy was hit severely and remained in recession for a longer period than the national economy, resulting in a decline in real per capita income.

Since the mid-1970s, growth in real per capita personal income has slowed, both in the state and in the nation. The slowdown in per capita personal income growth was more severe in the state than the nation through most of the 1980s. However, since 1988 the state has gained some ground relative to the nation in per capita income growth.

At the national level, the most commonly cited reason for sluggish personal income growth is the slowdown in productivity growth. This factor certainly also played a significant role in the earnings and income changes in the state. In addition, the state economy suffered from the collapse of non-oil commodity prices during the 1970s and the early 1980s that hurt its resource-based industries. Other contributing factors include the appreciation of the dollar in relation to foreign currencies in the first half of the 1980s that affected sales and employment in the state's export industries. The rise in real interest rates in the 1980s also contributed to lower demand for Washington's durable goods products. Two local events in the early 1980s – the sudden termination of the Washington Public Power Supply System construction project and the loss of jobs in the shipbuilding sector – exerted large, negative effects on state earnings and personal income. By 1985, the state per capita income was 0.6 percent below the national average.

In the second half of the 1980s, Washington experienced substantial job gains in aerospace and the high-tech manufacturing industries, along with a significant growth in the evolving high-wage “knowledge-based” service sectors. In addition, Washington's export industries were aided by a decline in the value of dollar relative to other currencies. As a result, real per capita income grew faster in the state than in the nation. In 1990, per capita income in the state rose to a level 1.7 percent above the national average.

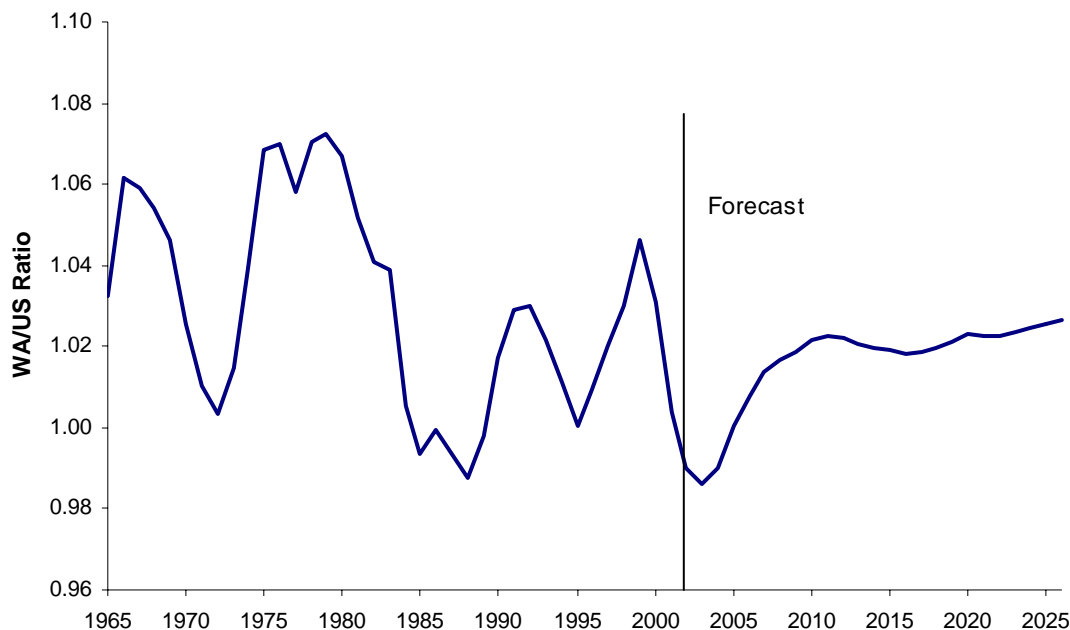
The state's economy was at full strength in 1990 when the U.S. economy was entering into a recession. In 1991, the aerospace sector started cutting back production to accommodate a shrinking commercial aircraft market. The negative income effect of the aerospace reduction offset to a large extent the income growth brought about by other prospering sectors (e.g., machinery manufacturing and business services) in the state. Real per capita income growth in Washington thus slowed down in the early 1990s, although the nation as a whole suffered an even greater drop in income growth. Between 1993 and 1995, the Washington economy stalled due to on-going job reductions in aerospace, while at the same time the national economic recovery picked up pace. Per capita income growth in the state relative to the U.S. average thus deteriorated during this period.

Economic growth in the state started accelerating in 1995. Manufacturing employment increased 5.7 percent from 1995 to 2001. Besides strong national economic growth that raised the demand for goods produced in the state, two-thirds of the manufacturing growth came from hiring at Boeing to accommodate surging airplane orders. By 2001, job growth in Washington was broad-based, covering both manufacturing and non-manufacturing sectors of the economy. Consequently, the state unemployment rate dipped to 5.2 percent, far below the average of 7.6 percent in the past three decades; and the employment-to-population ratio rose to a historic high. All of these have contributed to a big jump in per capita income growth. The recession hit in 2001 and real per capita income in the state dipped 0.1 percent from the previous year.

Over the long run, per capita income in Washington has trended closely with the national average. State per capita income averaged about 3 percent above the national level over the past three decades. However, the volatility of certain manufacturing and resource-based industries in the state periodically narrowed or widened the per capita income gap between Washington and the nation. In 1999, the state per capita income was 4.6 percent above the national average, a

record high since the late 1970s (Figure 4-5). But in the following two years the gap quickly narrowed to only 0.4 percent in 2001.

Figure 4-5
Ratio of Washington to U.S. Per Capita Income



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Outlook for Personal Income Growth in Washington

In the next 25 years, the Washington economy is expected to continue its diversification, with an industrial profile moving close to that of the nation. This development means that the state will likely experience more stable economic growth, thus less volatility in its personal income trends. But does this mean that the states per capita income level will converge to the national average in the future?

Long-term projections of state personal income suggest that Washington per capita personal income level will remain above the national average over the forecast horizon. But the gap between the state and the nation will narrow. Several factors contribute to the comparative strength of Washington's per capita income outlook:

- In the two and a half decades after 2001, worldwide aircraft demand is expected to remain strong.
- Washington will maintain a relatively healthy manufacturing base. For example, agriculture and food products in the state will continue to benefit from the improving access to worldwide food markets; and these markets are expected to expand as a result of increasing consumption by rapidly growing Pacific Rim economies.

- The state's high wage durable goods and high-technology industries will benefit from the expected macroeconomic trends toward lower and more stable real interest rates, accompanied by increasing international demand for capital goods.
- A more integrated global economy will help expand state exports and stimulate export-related business activities. Furthermore, Washington has the geographic advantage that endows it with great potential to attract foreign investments.
- Recent business expansion and investment activities in the state suggest that the state has had the critical mass to continue attracting a variety of high-tech manufacturing and knowledge-based business service industries. The growth of high wage jobs in these industries will help raise per capita income level.

The per capita income projection model, which is used to forecast state personal income growth, incorporates the above factors that are critical to explaining per capita income growth in Washington compared to the nation.

Per Capita Income Growth Trend

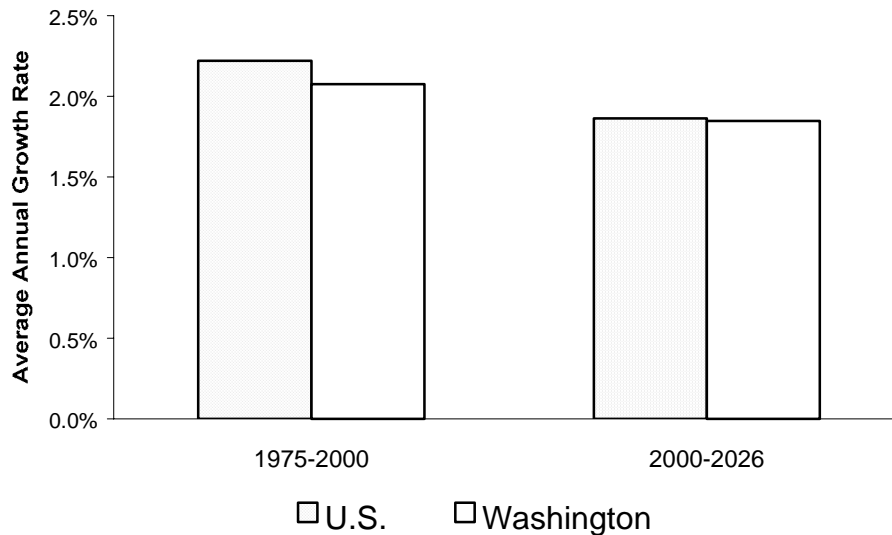
Between 1970 and 2001, real per capita income in the state grew at an average 2.1 percent per year. In the next 25 years, the growth will be slower at an annual pace of 1.9 percent (Figure 4-6). The projected lower growth rate is caused by the expected decline in labor force growth and lowering of the employment-to-population ratio, both resulting from an aging population. These negative factors are somewhat offset by the expected productivity growth. The same trends will prevail nationally.

Table 4-3 shows the long-term personal income forecasts for Washington and the U.S.

Table 4-3
Personal Income Trends: Washington and U.S.

Year	Total Real Personal Income (1996 Dollars)				Per Capita Income (1996 Dollars)			
	Washington (Billions)	Annual Change (%)	U.S. (Billions)	Annual Change (%)	Washington	Annual Change (%)	U.S.	Annual Change (%)
1975	62.20	4.1	3,503.96	0.5	17,310	2.3	16,205	-0.5
1976	66.13	6.3	3,681.33	5.1	18,041	4.2	16,862	4.1
1977	69.14	4.6	3,831.24	4.1	18,382	1.9	17,372	3.0
1978	75.43	9.1	4,037.31	5.4	19,389	5.5	18,112	4.3
1979	80.23	6.4	4,176.74	3.5	19,875	2.5	18,530	2.3
1980	82.10	2.3	4,208.74	0.8	19,695	-0.9	18,461	-0.4
1981	83.91	2.2	4,326.04	2.8	19,758	0.3	18,789	1.8
1982	83.76	-0.2	4,361.45	0.8	19,533	-1.1	18,763	-0.1
1983	85.27	1.8	4,452.33	2.1	19,716	0.9	18,982	1.2
1984	88.75	4.1	4,771.81	7.2	20,274	2.8	20,166	6.2
1985	91.35	2.9	4,951.47	3.8	20,605	1.6	20,739	2.8
1986	95.04	4.0	5,105.29	3.1	21,182	2.8	21,191	2.2
1987	97.85	3.0	5,248.74	2.8	21,453	1.3	21,592	1.9
1988	102.16	4.4	5,446.77	3.8	21,928	2.2	22,202	2.8
1989	108.24	6.0	5,619.24	3.2	22,643	3.3	22,687	2.2
1990	114.60	5.9	5,726.10	1.9	23,270	2.8	22,876	0.8
1991	117.85	2.8	5,719.67	-0.1	23,262	0.0	22,607	-1.2
1996	122.93	4.3	5,883.13	2.9	23,694	1.9	23,003	1.8
1993	125.39	2.0	5,980.37	1.7	23,646	-0.2	23,142	0.6
1994	128.87	2.8	6,152.06	2.9	23,846	0.8	23,577	1.9
1995	132.46	2.8	6,334.05	3.0	24,055	0.9	24,049	2.0
1996	139.32	5.2	6,547.33	3.4	24,861	3.4	24,630	2.4
1997	147.34	5.8	6,804.86	3.9	25,865	4.0	25,357	3.0
1998	158.48	7.6	7,207.68	5.9	27,417	6.0	26,614	5.0
1999	166.46	5.0	7,426.85	3.0	28,431	3.7	27,180	2.1
2000	171.40	3.0	7,737.29	4.2	28,931	1.8	28,064	3.3
2001	173.07	1.0	7,966.21	3.0	28,747	-0.6	28,636	2.0
Forecast								
2005	192.09		8,835.06		30,540		30,668	
2010	230.63		10,191.79		34,517		33,945	
2015	272.32		11,769.70		38,190		37,643	
2020	317.87		13,398.26		41,944		41,184	
2026	374.99		15,457.73		46,361		45,361	
Average Annual Growth Rate (%)								
2000-2005		2.3		2.7		1.1		1.8
2005-2010		3.7		2.9		2.5		2.1
2010-2015		3.4		2.9		2.0		2.1
2015-2026		3.1		2.6		1.9		1.8
2020-2026		2.8		2.4		1.7		1.6
1970-2000		4.1		3.2		2.2		2.2
2000-2026		3.1		2.7		1.8		1.9

Figure 4-6
Real Per Capita Income Growth



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Between 2001 and 2026, real per capita income growth in Washington is expected to average 1.9 percent per year, slightly above the forecast for the nation as a whole. By 2026, real per capita income in Washington will rise to \$46,360, about 61 percent above the 2001 level.

Combining per capita income increase with population growth, total state personal income is expected to more than double over the next 25 years, from \$173.1 billion in 2001 to \$375.0 billion in 2026 (1996 constant dollars). This represents an average annual growth rate of 3.1 percent during the forecast period, higher than the 2.7 percent rate projected for the nation. As a result, Washington's share of total national personal income increases from 2.2 percent in 2001 to 2.4 percent in 2026.

Special Analysis: Trends in Earnings

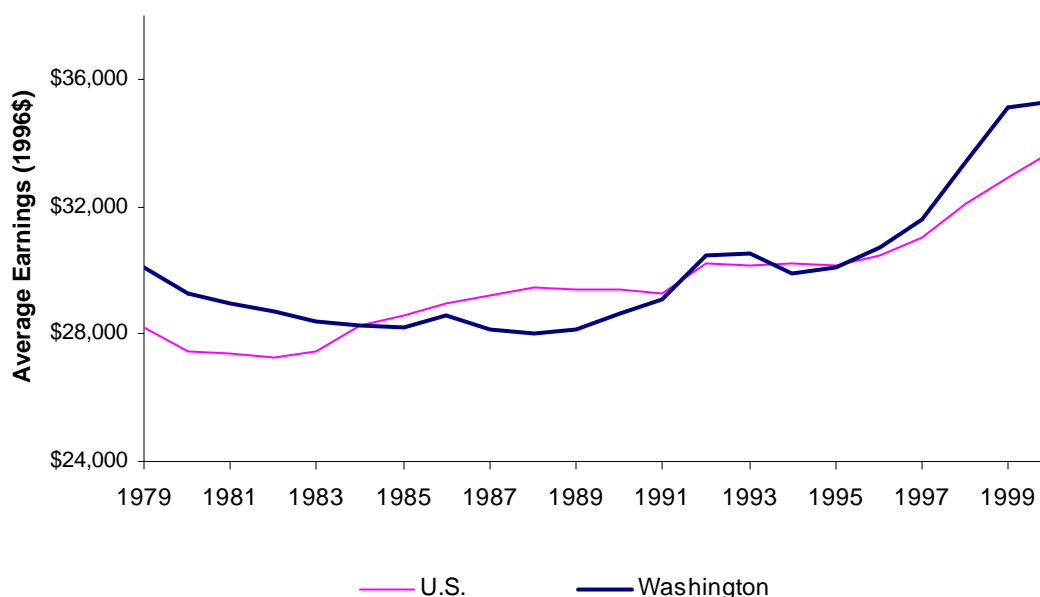
Earnings¹ account for more than two-thirds of total personal income. Changes in earnings thus set the tone for personal income growth. This section explores the sources of earnings changes in Washington over the past 20 years.

¹ The earnings data are estimated by the Bureau of Economic Analysis, U.S. Department of Commerce. Earnings include wage and salary disbursements, other labor income, and proprietors' income. Other labor income consists of the employers' contributions to benefit plans for their employees such as pensions and profit-sharing plans, group health and life insurance, supplemental unemployment insurance, privately administered worker's compensation plans, directors' fees, and other miscellaneous fees. While this definition of earnings does not include the value of all non-wage benefits, it is a much broader definition of compensation than just wage and salary disbursements.

Changes in Real Average Earnings in Washington, 1979-98

Changes in real average earnings in the state have exhibited a different course than the national average. Between 1979 and 1988, the state real average earnings declined relative to the U.S., but in 1988 the trend began to reverse. Washington gained significant ground in the second half of the 1990s and, by 2000, real average earnings in the state was about 5 percent above the national average (Figure 4-7).

Figure 4-7
Real Average Earnings: Washington vs. U.S.



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In 1979, Washington real average annual earning in 1996 constant dollars was \$30,072; but by 1988, real average earnings in the state dropped by \$2,053 to \$28,021. During the same period, real average earnings in the U.S. increased slightly from \$28,212 to \$29,492. In percentage terms, Washington's real average earnings per worker declined by 6.8 percent between 1979 and 1988, while real average earnings in the U.S. increased by 4.5 percent. Consequently, between 1979 and 1988, real average earnings in Washington changed from 6.6 percent above to 5.0 percent below the national average.

Since 1988, however, Washington's average earnings have grown faster than the U.S. average. In 2000, real average earnings in Washington rose to \$35,312, representing a gain of \$7,291 over the 1988 level. Real average earnings in the U.S. also increased during the period, but only by \$4,265. Over the period from 1988 to 2000, the state real average earnings rose by 26 percent, compared to the much lower growth of 14 percent for the nation as a whole. The earnings recovery in the state was disrupted in the 1993-95 period; but starting in 1996, real average earnings in Washington again exceeded the national average.

The analysis below allocates changes in real average earnings into four components:

- **Industry composition** – Industry composition refers to how jobs are distributed among the industries of the Washington or U.S. economy. Changes in industry composition affect average earnings because wage and earning levels vary among industries. A shift in employment from high-wage to low-wage industries affects aggregate average earnings.

Over the last two decades both the state and the nation have seen a dramatic change in industry composition. In both economies there has been a shift away from high paying manufacturing jobs toward lower paying retail trade and services jobs. In the 1980s, this shift slowed down the growth of real average earnings in the U.S., but contributed to an actual decline in real average earnings in Washington.

- **Changes in real earnings within industries** – This component, by far, has been the most important contributor to the changes in Washington’s real average earnings over the past two decades. Changes in real average earnings within industry sectors can be caused by a variety of factors including new technologies, changes in organizational structures, unionization, labor force supply, product and market changes, or the cyclical performance of the regional, national, and international economies.
- **Incidence of part-time jobs** – Since average earnings are computed by dividing employment (with no regard to part-time or full-time status) into total earnings, an increase in the incidence of part-time work would decrease average earnings. Part-time workers typically earn less than full-time workers in the same industry, due to fewer working hours and lower average wage rates. The fact that part-time workers often receive no or only partial non-wage benefits also lowers the earnings of part-time workers in relation to full-time workers. The percentage of part-time jobs relative to full-time jobs has been increasing steadily in the 1980s.

Trends in part-time employment are also related to changes in industry composition. Manufacturing jobs tend to be full-time. A much higher proportion of jobs in services and retail trade are part-time jobs. The steady loss of high quality, “family wage” jobs has been accompanied by a rise in part-time employment. Many part-time jobs are held by the second wage earners in households. While the entry of secondary household wage earners may have contributed to raising household incomes, to some extent it has also been a response to the decline in real average earnings of primary workers in the households.

- **State versus national factors** – In addition to the contributions of industry composition, growth in part-time jobs, and earnings changes within industries, this analysis also examines the relative contributions of state and national factors to changes in Washington’s average earnings. For example, some changes in industry composition in Washington resulted from national forces affecting all states, while other changes were due to factors particular to Washington. Thus in the analysis, the “industry composition” component of the earnings change is further divided into changes due to national factors versus unique state conditions. A similar distinction is provided for the other two factors affecting real average earnings.

The method used to compute the components of earnings change is depicted in detail in Appendix A of this chapter.

Real Average Earnings Decline in Washington, 1979-88

Washington real average earnings declined by \$2,053 from 1979 to 1988. The contributions of each of the four components of change are shown in Table 4-4. The first component, the change in industry composition, is responsible for about 38 percent of the total change. As the breakdown between national and state factors indicates, the change in Washington industry composition was strongly influenced by national trends during this period. This reflects the fact that most of the employment growth in both Washington and the U.S. between 1979 and 1988 took place in the lower wage employment sectors such as services and retail trade.

Table 4-4
Washington Real Average Earnings*: Components of Change (1979-88)

	Change Resulting from			Total Change
	Industry Composition	Incidence of Part-Time Work	Average Earnings Within Industries	
State Factors	(\$16)	(\$330)	(\$2,869)	(\$3,215)
National Factors	(\$755)	\$49	\$1,868	\$1,162
TOTAL	(\$771)	(\$281)	(\$1,001)	(\$2,053)

*In 1996 dollars.

The second component of change is the incidence of part-time work. There was a large difference in the growth rates of part-time work for Washington and the U.S. between 1979 and 1988. In 1979, Washington and the U.S. were fairly close in the incidence of part-time work; the proportion of Washington workers employed on a part-time basis represented 18.7 percent of total employment, and in the U.S. the proportion was 17.8 percent. Over the next ten years, the state's proportion of part-time employees increased more than the U.S. average. By 1988, Washington had 20.5 percent of total employment in part-time jobs, significantly above the 18.6 percent share for the nation. However, as Table 4-4 indicates, this component had a relatively small effect on the change in real average earnings in the state, accounting for only about one-seventh of the 1979-88 decline in real average earnings in Washington.

The third and largest contributor to the earnings decline in the 1980s is the change in real average earnings within industries. Almost half of the decline in real average earnings in Washington could be attributed to this component of change. State factors made a very large negative contribution to this change, which was offset somewhat by positive national changes. From 1979 to 1988, real average earnings declined within virtually all sectors of the Washington economy.

Rebound in Washington Real Average Earnings, 1988-98

The divergence of growth trends in real average earnings between the U.S. and Washington reached its maximum in 1988, since then the state experienced faster earnings growth and closed the gap. Earnings growth in the state accelerated in the second half of the 1990s.

As Table 4-5 shows, by 2000 real average earnings in Washington had recovered much more than the ground lost in the 1980s. Changes in industry composition continued to have a significant negative contribution to average earnings during the period from 1988 to 2000. However, this negative effect of changing industrial composition on earnings growth was not unique for this state, but occurred nationwide.

Table 4-5
Washington Real Average Earnings*: Components of Change (1988-2000)

	Change Resulting from			Total Change
	Industry Composition	Incidence of Part-Time Work	Average Earnings Within Industries	
State Factors	\$46	(\$182)	\$4,074	\$3,938
National Factors	(\$1,168)	\$504	\$4,017	\$3,353
TOTAL	(\$1,121)	\$321	\$8,091	\$7,291

*In 1996 dollars.

From 1988 to 2000, the incidence of part-time work in Washington declined, but not as much as that occurred in the nation as a whole. The incidence of part-time working produced a modest positive effect on real average earnings in the state.

As in the 1979-88 period, the biggest contributor to the change in Washington average earnings since 1988 was the earnings changes within industries. In a reversal of the trend from 1979 to 1988, real average earnings in Washington grew in most industrial sectors. Between 1988 and 2000, a \$8,091 increase in Washington real average earnings was due to changes in this component. About half of this increase could be attributed to unique state conditions in addition to the effect of national factors.

Some Explanations for the Earnings Changes

There are many possible explanations of the causes of earnings changes. Analysis of the nationwide survey data and other more detailed information is required for a better understanding of the earnings changes in the state. However, based on aggregate level employment and earnings data presented here and other similar data analyzed at the national level, the following factors appear critical in affecting the earning changes:

- **National factors in the change in industry composition** – Over the past 20 years, high-paying jobs were lost as many U.S. manufacturing industries failed to keep an edge over advances abroad in technology, organization, and management. The spread of advanced mass production

technologies to developing or newly developed countries, together with the increased global mobility of capital, also resulted in a shift of some production abroad.

Between 1979 and 1988, two monetary developments further eroded the base of high-paying production jobs. The enormous appreciation of the dollar value in relation to foreign currencies in the late 1970s and early 1980s made the cost of U.S. goods much higher abroad and the prices of foreign goods much lower at home. In addition, high real interest rates in the U.S. discouraged domestic investment and depressed the demand for durable goods.

These circumstances exacerbated a long-term decline in manufacturing jobs due to increases in worker productivity. For example, by the late 1980s, Washington's lumber and wood products industry was producing the same amount of lumber as in the late 1970s, with about one-third fewer workers.

- **State factors in the change in industry composition** – The negative effect of industry composition on personal earnings in Washington merely mirrored a nationwide phenomenon. Still, some special circumstances had occurred in the state that either raised or depressed the local earning levels. For example, the termination of Washington Public Power Supply System nuclear reactor construction resulted in the loss of thousands of high-skill, high-wage construction jobs in the early 1980s.
- **State factors in the 1979-88 earnings decline within industry sectors** – For many Washington industries, a large portion of their output is exported. The fortunes of these Washington industries depend heavily upon the markets outside the state. The state economy began the 1980s with relatively high wages, strong labor unions, but dependence on several major manufacturing sectors that were increasingly subject to international competitive pressures. Also, in the 1980s, competitions from other regions of the country against major Washington sectors such as lumber, shipbuilding, and aluminum, placed additional downward pressure on wages in Washington industries.

Real average wages declined in nearly all sectors of the Washington economy during the 1980s. Productivity gains, which had boosted real wages in the 30 years after World War II, slowed down considerably in the 1970s and 1980s. Competitive international pressures (exacerbated by a rising dollar) also forced businesses to reduce costs and hold down wages. Real wage declines in manufacturing and construction spread to services, retail trade, and other secondary sectors.

- **State factors in the 1988-2000 earnings rise within industry sectors** – Since the late 1980s, the employment profiles have changed for many major industries in Washington. High-skilled and high-paid occupations account for an increasing share of jobs in many industrial sectors. For example, in manufacturing, a growing proportion of the employment are professional technicians and engineers, outpacing the growth in supporting staff (i.e., clerks and secretaries) and production/assembly line workers. Consequently, within-the-industry earnings have been rising rapidly and have contributed to a significant increase in average aggregate earnings in the state. In addition to the exceptional productivity gains, the soaring equity market in the second half of the 1990s has contributed substantially to the earnings of workers in the state's growing high-tech industries (namely, software, e-commerce, and biotechnology), where vested stock options comprise a major portion of employee compensation.

APPENDIX 4-A
DECOMPOSITION OF AVERAGE EARNINGS

	Change in Industry Composition	Change in Average Earnings Within Industries	Change in Incidence of Part-Time Work	Total Change
State Factors	Sc	Sw	Spt	Stot=Sc+Sw+Spt
National Factors	Nc	Nw	Npt	Ntot=Nc+Nw+Npt
Total	Ctot=Sc+Nc	Wtot=Sw+Nw	PTtot=Spt+Npt	CHtot=Ctot+Wtot+PTtot

Ctot =

$$\Sigma[\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * \text{PTpct79} * 0.5] + [\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot79} -$$

$$\Sigma[\text{AVEARNfte79} * \text{SHARE88} * \text{EMPtot88} * \text{PTpct79} * 0.5] + [\text{AVEARNfte79} * \text{SHARE88} * \text{EMPtot88} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot88}$$

Nc =

$$\Sigma[\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * \text{PTpct79} * 0.5] + [\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot79}$$

$$\Sigma[\text{AVEARNfte79} * \text{NSHARE88} * \text{EMPtot88} * \text{PTpct79} * 0.5] + [\text{AVEARNfte79} * \text{NSHARE88} * \text{EMPtot88} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot88}$$

Sc = Ctot - Nc

Wtot =

$$\Sigma[\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * \text{PTpct79} * 0.5] + [\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot79} -$$

$$\Sigma[\text{AVEARNfte88} * \text{SHARE79} * \text{EMPtot88} * \text{PTpct79} * 0.5] + [\text{AVEARNfte88} * \text{SHARE79} * \text{EMPtot88} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot88}$$

Nw =

$$\Sigma[\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * \text{PTpct79} * 0.5] + [\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot79}$$

$$\Sigma[\text{NAVEARNfte88} * \text{SHARE79} * \text{EMPtot88} * \text{PTpct79} * 0.5] + [\text{NAVEARNfte88} * \text{SHARE79} * \text{EMPtot88} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot88}$$

Sw = Wtot - Nw

PTtot =

$$\Sigma[\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * \text{PTpct79} * 0.5] + [\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot79} -$$

$$\Sigma[\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot88} * \text{PTpct88} * 0.5] + [\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot88} * (1 - \text{PTpct88}) * 1.0] / \text{EMPtot88}$$

Npt =

$$\Sigma[\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * \text{PTpct79} * 0.5] + [\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot79} * (1 - \text{PTpct79}) * 1.0] / \text{EMPtot79}$$

$$\Sigma[\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot88} * \text{NPTpct88} * 0.5] + [\text{AVEARNfte79} * \text{SHARE79} * \text{EMPtot88} * (1 - \text{NPTpct88}) * 1.0] / \text{EMPtot88}$$

Spt = PTtot - Npt



CHAPTER 5

Economic Conditions During The 2001 Recession (Part I)*

The National Bureau of Economic Research (NBER) has officially declared that the national recession started in April 2001, ending a 10-year expansion of the U.S. economy. The economy experienced a significant decline in the second quarter of 2001, and the tragic September 11th terrorist attack, the first one ever on the American homeland, delayed the recovery. However, Gross Domestic Product, after dropping 1.6 percent and 0.3 percent at an annualized rate in the second and third quarters of 2001, respectively, stabilized and managed to grow 2.7 percent in the following quarter.

The September 11th attack caused a significant loss of life and physical damage; but the U.S. economy, because of its size and diversity, proved resilient. For example, air transportation, the industry hit hardest by the attack, represented only 0.8 percent of total national output. In addition, the nation's advanced technological infrastructure has shown tremendous capability to overcome major disruptions, sustain services and support business activities.**

Still, the terrorist attack has had some significant ramifications for the economy: defense spending over the next few years will likely go up from the current 3 percent share of the nation's total output; and society's priorities will certainly shift to devoting more resources to domestic safety and security.

NBER has not declared a precise end to the 2001 recession. This paper discusses the economic changes on the state and national levels that had occurred through the first quarter of 2002.

National Conditions

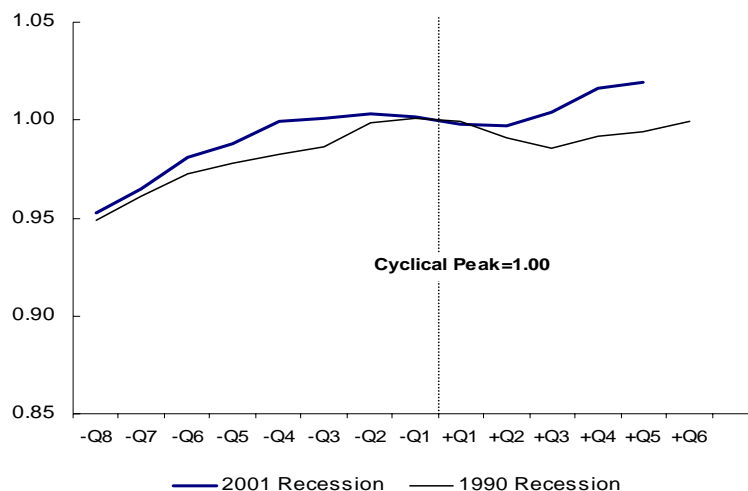
The 2001 recession is a shallow one.

Gross Domestic Product (GDP), the broadest measure of the national economy, began contracting in the first quarter of 2001, even before the recession started. However, through three consecutive quarters of decline in 2001, GDP registered a total drop of only 0.6 percent. In contrast, GDP lost 1.5 percent during the 1990-91 recession.

* Part II of this Study will contain more detailed analyses of the changes in wage and income distributions, using the OFM State Population Survey data.

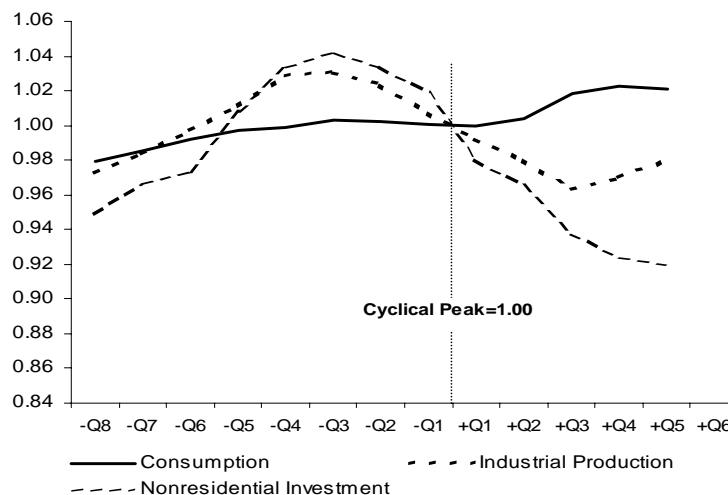
** When the attack damaged phone lines, many people in the affected areas used cellular phones to communicate with the "outside world"; and many workers whose access to their workplace was severed could promptly set up an arrangement to work at home through Internet communications.

Figure 5-1
Real Gross Domestic Product



This is a production/high-tech/investment-led recession. Aggregate industrial production and non-residential investment started declining three quarters before the beginning of the recession. By the first quarter of 2002 they had been reduced by 5.8 percent and 11.4 percent, respectively, far more severe than the GDP decline. Because high-tech sectors contributed substantially to growth in the second half of the 1990s, entering into the latest recession they were vulnerable to a hard correction. Semiconductor production had dropped 17.5 percent between the last quarter of 2000 and the third quarter of 2001.

Figure 5-2
Consumption, Production, and Investment



The industrial capacity utilization rate is the ratio of actual production to capacity (or potential production level). That rate sank to 75 percent by the end of 2001, compared to the long-term average of 82 percent. As a result, business investment collapsed. Total nonresidential investment plummeted 10.6 percent in 2001.

Consumer spending has been relatively healthy. Consumption accounts for more than 60 percent of GDP, so nearly every past recession was accompanied by a decline in consumer spending. In the two years before the 2001 recession started, consumer expenditures rose at an annual rate of 4.0 percent. Consumer spending remained flat during the first three quarters of 2001, but bounced back in the following two quarters, averaging a 3.8 percent annual growth rate. This is the main reason why the recession is shallow, as consumption has cushioned the economic condition that has been suffering from cutbacks in business investment. Consumer spending was kept afloat during the recent recession due in part to special deals and discounts offered by automakers.

The housing market has been strong. Housing starts in the nation over the past 40 years averaged 1.5 million units a year; but during past recessions starts usually dropped to less than 1 million. However, housing starts did not decline this time, maintaining a level of around 1.6 million units. Low mortgage rates – about 3 percentage points below the rates prevailing during the 1990-91 recession – were the major reason. The bursting of the stock market bubble, low returns from other interest-bearing investment alternatives, and a robust trend in housing price appreciation together contributed to a shifting of personal investment toward housing.

Interest rates and inflation have remained low. Typically, inflation rates tend to increase during expansions as excess capacity in the economy is used up and the growing economy creates upward pressure on prices and wages. In order to keep inflation in check the Federal Reserve System usually increases the discount rate and the federal funds rate to slow down the growth in the money supply and reduce the growth rate of inflation. This leads to a fairly typical trend of increasing inflation rates being combated by increasing interest rates just before a recession. During recessions, the Federal Reserve System normally eases up on the restrictions on the money supply causing interest rates to fall and borrowing to increase, stimulating the economy.

In the current recession, however, there is little room for the Federal Reserve System to invigorate the economy with lower interest rates since the discount has been at a historically low 1.25 percent since December 2001. Prior to the 1990-91 recession, the discount rate was steady at 7.0 percent but only about 3.5 percent before the 2001 recession. Other interest rates were also low going into the current recession. Conventional mortgage rates were slightly above 10 percent just before the 1990-91 recession compared to about 7 percent just before the 2001 recession. Likewise the bank prime rate was 10 percent just before the 1990-91 recession and 8 percent and falling just before the 2001 recession. Also, the interest rate on 6-month Treasury bills on the secondary market was almost 4 percent lower just before the 2001 recession compared to just before the 1990-91 recession.

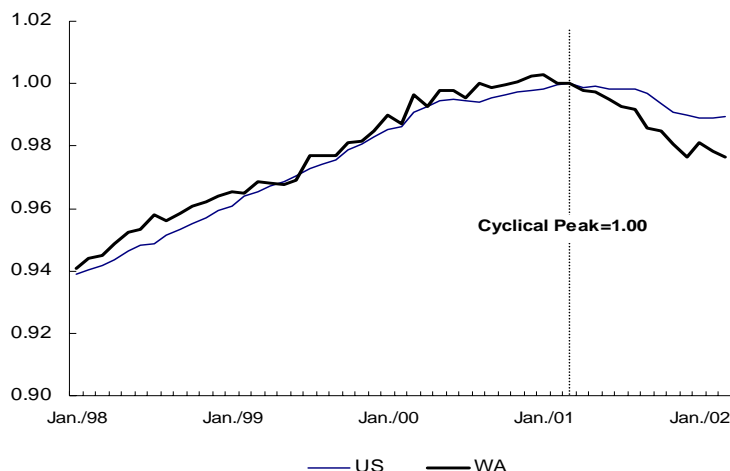
The U.S. Consumer Price Index bounced around between 4.5 percent and 5.5 percent in the months just before the 1990-91 recession. By contrast, the U.S. CPI was around 3.5 percent and falling in the six months before the 2001 recession. The U.S. Implicit Price Deflator for Personal Consumption was also higher before the earlier recession. The U.S. IPD for Personal Consumption was 5.3 percent and 4.3 percent in the two quarters just before the 1990-91 recession, but only 1.9 percent and 3.2 percent in the two quarters just before the 2001 recession.

Washington Conditions

There is no official measurement and dating of recession conditions at the state level. Employment, a coincidental indicator of the national business cycles, is usually used to gauge the cyclical status of the state economy.

Employment in Washington declined more severely than the national average. While employment in the nation essentially remained flat in the first nine months of 2001, the number of jobs in the state declined more than 2 percent. In March 2002, Washington employment was 2.3 percent below the level a year ago, compared with a more moderate nationwide decline of 1.0 percent.

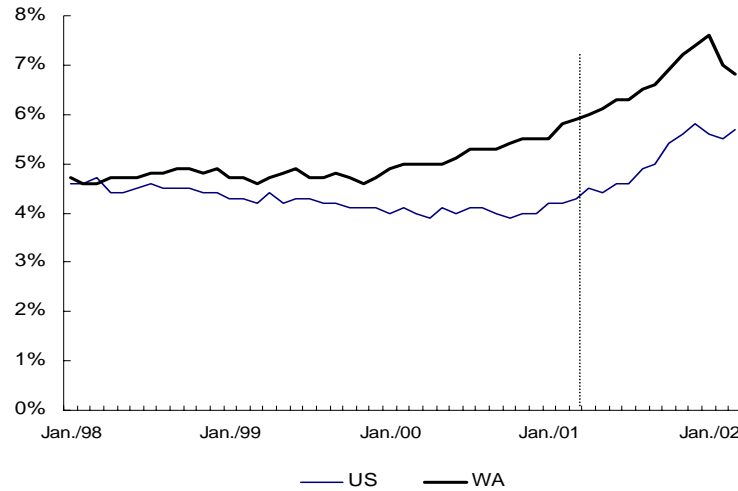
Figure 5-3
Total Non-Agricultural Employment



Unemployment rate rose, but more moderately than in the past recessions. Jobless rates in the state averaged 7.5 percent in the past 30 years. The rate has generally jumped above the 10 percent level during recessions. In the 1990s, the state experienced significantly lower unemployment rates averaging 6.0 percent. Since reaching a level at par with the national average at the beginning of 1998, the state's rate gradually rose, and accelerated after the recession started. By March 2002, a year into the recession, the state unemployment rate reached 6.8 percent, slightly more than 1 percentage point above the national average. The state rate during the 2001 recession is comparable to that in the 1990-91 recession, but much lower than the 12 percent jobless rate experienced during and immediately following the 1980-82 dual national recessions.

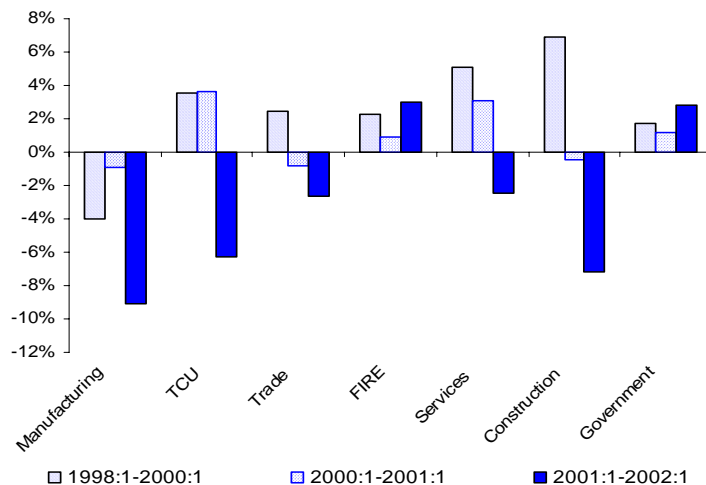
However, a contracting workforce accompanied the low state unemployment rate in the 2001 recession. The shrinking labor force resulted from two factors. First, some workers left for jobs available in other states. Second, some jobless workers were not counted as part of the labor force because they quit looking for work when job opportunities dimmed during the recession. Labor force growth in Washington started slowing down in 1999, due in large part to the job reductions in the aerospace industry. Subsequently, with worsening conditions in the general economy, the state labor force declined by 79,000 workers, or 2.6 percent, between 1999 and 2001.

Figure 5-4
Unemployment Rate



Manufacturing, TCU (transportation, communication, and utilities), and construction industries were hit hard. A year into the recession, manufacturing employment dropped 9.2 percent. Substantial job losses occurred in durable-goods manufacturing including aerospace and other high-tech sectors. In the year following the first quarter of 2001, durable-goods manufacturing sectors excluding aerospace lost 17,700 jobs, or 11.4 percent. Job cuts in Washington’s aerospace industry started much earlier in the third quarter of 1998, totaling 34,300, or 30 percent, by the first quarter of 2002.

Figure 5-5
Employment Changes (Annualized)



Construction employment in the state contracted 7.3 percent between the first quarter of 2001 and the first quarter of 2002. During that period, market vacancy rates for apartments, offices and industrial buildings soared and the rental rates slumped. Many commercial building projects in different stages of the development pipeline – including a few already under construction – were put on hold. Public construction activities also

dropped, as nearly all levels of government have been struggling with revenue and budget shortfalls. The only bright spot was housing construction, but that was overwhelmed by the weaknesses in other segments of the construction industry.

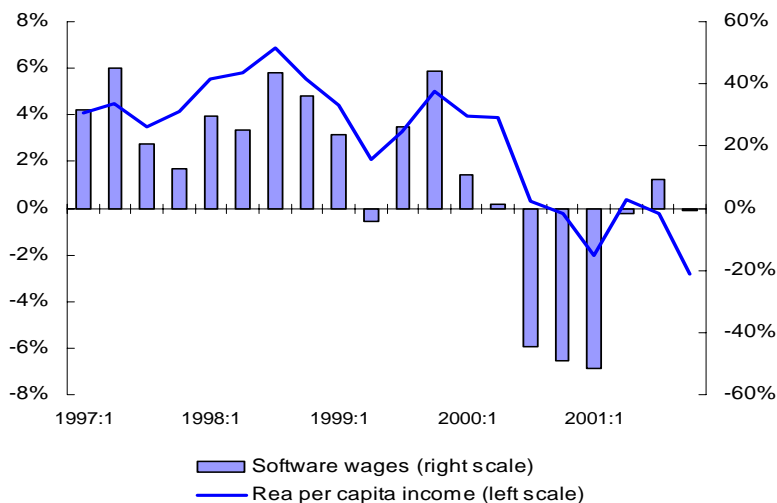
Along with the general economy, TCU employment in the state started declining in the first quarter of 2001. The difficulties facing the air transportation sector were exacerbated by the September 11th attack. In the mean time, substantial job cuts took place in the telecommunication industry, where profits and investment collapsed. Total TCU jobs in the state dropped 6.2 percent over the year.

Service and trade employment declined. Wholesale and retail employment suffered three consecutive quarterly losses, for a total of 19,000 jobs, before stabilizing in the first quarter of 2002. Service sectors lost 20,000 jobs over the year. Reductions in trade and services jobs have not occurred since the 1980-82 recession. Businesses services, a growth engine in the 1990s, saw its employment slide 13.3 percent.

F.I.R.E. (finance, insurance, and real estate) is the only private industry that continued to grow during this recession. The industry benefited from lower interest/mortgage rates, the flourishing housing market, and home refinancing. Employment growth even accelerated to 3.0 percent in 2001, from a mediocre 0.9 percent rate in the previous year.

Real per capita income dipped in 2001. Between 1997 and 1999, real per capita income in the state – which roughly reflects productivity growth and gains in “standard of living” – grew at a robust annual rate of 4.8 percent, much higher than the national average of 3.5 percent. A major contributor was the software industry, in which employees’ exercise of stock options took advantage of the booming stock market. In 1999, wages for all jobs in the state averaged \$35,510. The average was substantially lower at \$31,360 when software wages were excluded. Real per capita income growth in the state has been dropping since the first quarter of 2000, due to the stock market declines and the weakening labor market.

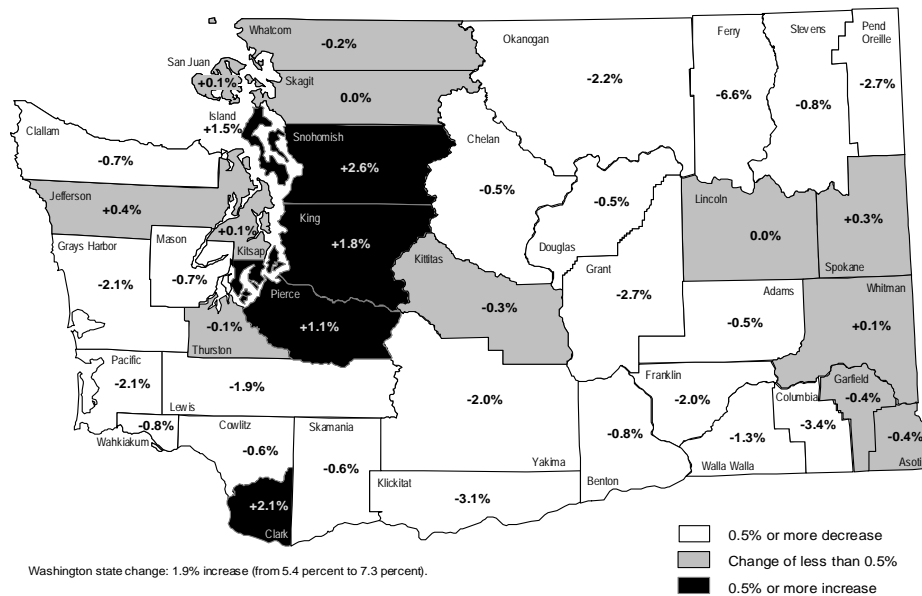
Figure 5-6
Real Per Capita Income: Over-the-Year Change



Total personal income is composed of labor earnings, DIR (dividends, interest, and rent), and transfer payments (retirement, medical, and income maintenance payments, etc.). Generally, labor-related earnings are the main contributor to personal income growth. But as the economy plummeted, other income sources became more important. In 1998 and 1999, earning gains drove income growth. In 2000, growth of DIR and transfer payments overrode the earnings increase; and in 2001, transfer payments, which surged 7.1 percent, was the only income component that grew during that year. By the end of 2001, earnings, DIR, and transfer payments represented 69.7, 17.7 and 12.7 percent of total personal income, respectively; in comparison, the corresponding shares were 70.9, 17.5, and 11.5 percent, respectively, in the fourth quarter of 1999.

The “two Washingtons” reversed fortune. In the last 15 years, the name “two Washingtons” usually referred to the contrast between economic growth and prosperity in the Puget Sound metropolitan counties and the depressed conditions in the rest of the state. However, relative economic performance reversed during the recession. Unemployment rates in King, Pierce, and Snohomish counties soared, while total labor force contracted. On the other hand, the “other Washington” except Clark County, saw minor changes or even declines in unemployment rates, and the labor force remained stable after the recession started.

Figure 5-7
Change in Unemployment Rate, March 2001- March 2002



Implications for the Recovery

The 2001 recession is a production-side recession, led by unsustainable business capital investment and equity market bubbles. Consumer spending and the housing market remain relatively healthy so far. This suggests that the coming recovery will be a slow

and weak one. Many factors that traditionally lead a recovery, such as a rebound in housing, growing sales of consumer durable goods, and lower interest rates were not significantly affected by this recession and thus cannot provide much stimulus needed for a vigorous rebound. The federal government is also unlikely to provide much stimulus to the economy. The discount and federal funds rates are already at historical lows since the Federal Reserve System repeatedly lowered those rates in the months and years before the recession in an attempt to create a “soft landing” for the economy and avert a recession. It seems unlikely that the Fed will undertake further interest rate cuts given that the discount rate is already at 1.25 percent. There is little likelihood that additional fiscal stimulus is forthcoming from the federal government either. Federal income and estate taxes were cut at the beginning of President Bush’s term, but these are unlikely to boost economic activity now that they are expected. Also, the \$5 trillion plus federal surplus has been replaced with modest deficits for the foreseeable future. This makes the possibility of any additional fiscal stimulus from the U.S. Congress and the President appear remote.

Consumer spending may falter in the near future as the stock markets continue to decline. The “wealth effect” of rapidly growing stock prices as well as generous stock options made consumers feel better off which led to more spending. Those two factors are no longer present. Indeed, the bear market may convince many consumers that it is time to be conservative and reduce expenditures. This would add another drag to economic recovery.

The recent dollar declines against major trading partners’ currencies may help U.S. manufacturing industries, but business capital investment holds the key to reinvigorating the economy. Judging by the current low capacity utilization rates and a weak prospect for corporate profits, business investment will grow at a very gradual pace.

Washington’s recovery is not likely to be any stronger than the national recovery. Washington’s economy benefited more than most state’s economies from stock option income and the bull market in hi-tech, software and dot com stocks. Stock option income is significantly lower, especially when compared to the late 1990s.

Also, it is unlikely that the aerospace industry in Washington will rebound significantly in the near future. Even before last September 11 most major air carriers were already in financial difficulty. Air travel has been slow to rebound since then and the financial aid offered by the federal government is unlikely to induce airlines to buy more aircraft.

Consistent with this perspective, the Economic and Revenue Forecast Council predicts about 6 percent per year growth in personal income for Washington in the 2003-05 Biennium, a relatively modest rebound by historic standards.

Table 5-1
Washington Non-Agricultural Wage and Salary Employment
(Seasonally Adjusted)

<i>(Thousands)</i>	1st Qtr./ 1997	1st Qtr./ 1998	1st Qtr./ 1999	1st Qtr./ 2000	1st Qtr./ 2001	1st Qtr./ 2002
TOTAL	2474.5	2566.6	2628.7	2696.8	2723.5	2652.0
MANUFACTURING	361.0	381.0	370.9	351.9	348.6	316.9
Durable Goods	251.6	272.2	263.1	242.9	242.0	217.2
Aluminum	7.6	7.9	7.1	7.1	5.8	3.9
Industrial Machinery & Equipment	26.0	27.1	25.0	25.3	25.4	22.0
Electronic & Other Electric Equip.	16.4	18.2	18.5	19.4	21.3	16.3
Transportation Equipment	112.1	127.2	122.6	100.3	100.8	92.2
Aircraft and Parts	98.0	112.1	106.7	84.4	86.7	79.6
Instruments & Related	14.4	15.1	14.8	14.5	14.6	14.0
Nondurable Goods	109.4	108.9	107.8	109.0	106.6	99.6
CONSTRUCTION	134.3	140.1	149.7	160.7	160.0	148.3
TRANSP., COMM. & UTIL.	131.9	133.9	137.8	144.0	149.2	140.0
Transportation	87.4	89.7	91.4	93.2	94.7	88.4
Communications	28.2	28.9	31.1	34.5	38.0	35.2
Electric, Gas and Sanitary Services	16.3	15.3	15.4	16.3	16.5	16.4
WHOLESALE & RETAIL TRADE	600.2	616.2	632.3	647.9	642.4	625.4
Wholesale Trade	147.3	152.2	154.2	154.3	147.2	140.0
Retail Trade	452.9	464.1	478.2	493.6	495.3	485.4
FINANCE, INSURANCE & REAL ESTATE	125.6	131.7	137.4	137.8	139.1	143.2
Finance	53.9	57.2	60.6	61.5	62.6	64.8
Insurance	38.7	40.0	41.7	40.9	41.7	43.0
Real Estate	33.0	34.5	35.1	35.5	34.8	35.4
SERVICES	664.8	697.4	726.6	771.5	780.8	760.8
Business Services	139.0	150.6	161.7	181.5	188.1	163.1
Health Services	176.2	183.3	187.5	190.5	195.8	203.0
GOVERNMENT	453.2	462.8	470.5	479.5	499.8	514.2
Federal	67.9	67.6	68.2	67.9	67.5	68.7
State	130.5	133.1	136.6	139.6	142.0	145.7
State Education	68.9	71.3	72.6	74.7	76.1	78.6
Local	254.9	262.2	265.7	271.9	290.4	299.8
Local Education	135.9	139.5	141.2	144.2	147.6	151.2

Sources: Economic and Revenue Forecast Council, Employment Security Department.